

BSEC: Baltimore Social- Environmental Collaborative

*Urban Integrated
Field Laboratory*

What is BSEC?

The BSEC UIFL co-generates urban science in partnership with Baltimore communities. This is achieved in an iterative process of model and observation improvement and participatory evaluation of adaptation and mitigation options. In the process, researchers and community members address fundamental science questions formulated to respond to the city's information needs. Ultimately, BSEC's mission is to create a truly community-centered urban climate observatory, based not just on theory but in real neighborhoods, to contribute to climate action plans that make environmental justice a priority.

Principal Investigator Lead Institution

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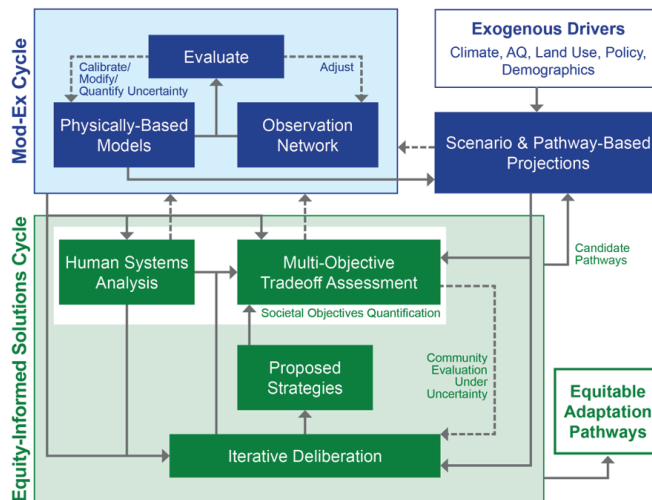
Johns Hopkins
University

Partner Institutions

- Baltimore City Department of Public Works
- Baltimore City Office of Sustainability
- Baltimore Climate Resilience Coalition
- Baltimore Gas and Electric
- Blue Water Baltimore
- Cary Institute for Ecosystem Studies
- City University of New York
- Drexel University
- Morgan State University
- National Renewable Energy Laboratory
- Oak Ridge National Laboratory
- Parks and People Foundation
- Pennsylvania State University
- Plantation Park Heights Urban Farm
- Temple X Schools
- The New Broadway East Neighborhood CDC
- The Old Goucher Neighborhood Association
- United States Forest Service
- University of Maryland–Baltimore County
- University of Virginia

What Are Urban Integrated Field Laboratories?

The U.S. Department of Energy Biological and Environmental Research program supports four urban integrated field laboratories (UIFLs) that aim to inform equitable climate and energy solutions to strengthen community-scale resilience across urban landscapes. UIFLs represent diverse demographic characteristics, differing climate-induced pressures on people and infrastructures, and unique settings.



The BSEC Equitable Pathways approach aligns urban science with information needs through coupled cycles of model and observation improvement and participatory assessment of climate risks in the context of multiple potentially competing priorities.

Research Approach

Through BSEC's Equitable Pathways model, climate scientists pursue solutions for urban areas that are co-designed with communities and are responsive and adaptive to community concerns.

Vision

BSEC will produce the urban climate science needed to inform community-guided potential equitable pathways for climate action.



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Biological and Environmental Research Program



Baltimore
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BSEC lead principal investigator Ben Zaitchik talks with community leaders about a recently installed weather station during a field visit to Baltimore's Old Goucher and Broadway East neighborhoods. [Reprinted with permission from Aman Azhar, Inside Climate News]

RESEARCH QUESTIONS



BSEC seeks to address fundamental and translational urban science questions from across natural and social science disciplines, including:

- How do changes to elements of Baltimore's landscape change specific aspects of weather (such as temperature, humidity, and rainfall) and air pollution both indoors and outdoors?
- How are trends in extreme rainfall changing urban flood risk, and how can landscape and infrastructure change to reduce those risks?
- Which energy, infrastructure, and ecosystem interventions can most effectively reduce greenhouse gas emissions while alleviating energy poverty and improving health outcomes?

BSEC BY THE NUMBERS

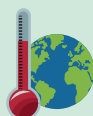
11 PARTNERING SCIENCE INSTITUTIONS

8+
ENGAGED
COMMUNITY
PARTNER
ORGANIZATIONS

4 COMMUNITY-IDENTIFIED
CLIMATE PROBLEM AREAS



INDOOR/OUTDOOR
AIR QUALITY



EXTREME HEAT



FLOODING

DECARBONIZATION



\$24.8
MILLION
IN FEDERAL
FUNDING TO STUDY
CLIMATE CHANGE
IN BALTIMORE

>20 WEATHER STATIONS OPERATED BY BSEC ACROSS BALTIMORE



East Baltimore community resident Margaret Griffin, left, looks on as BSEC scientists Dr. Shamara Collins and Lei Hao install a weather station in an empty plot next to Griffin's house. The equipment will measure weather patterns and inform community-scale adaptation strategies for the city. [Reprinted with permission from Aman Azhar, Inside Climate News]

RESEARCH SPOTLIGHT

Understanding the causes and developing equitable solutions for urban heat, flooding, and air pollution requires neighborhood-scale information on weather conditions. However, there is a lack of surface weather measurements within cities, especially in low-income communities. BSEC is placing weather stations across Baltimore City, with a focus on underserved neighborhoods.

Front Image Credit: As the effects of climate change worsen, the heaviest burdens fall on underinvested urban communities and neighborhoods in Baltimore. BSEC recognizes that climate solutions must be co-designed with communities to be just and effective. [Getty Images]

BSEC WEBSITE

21cc.jhu.edu/bsec



UIFL WEBSITE

ess.science.energy.gov/urban-ifls

