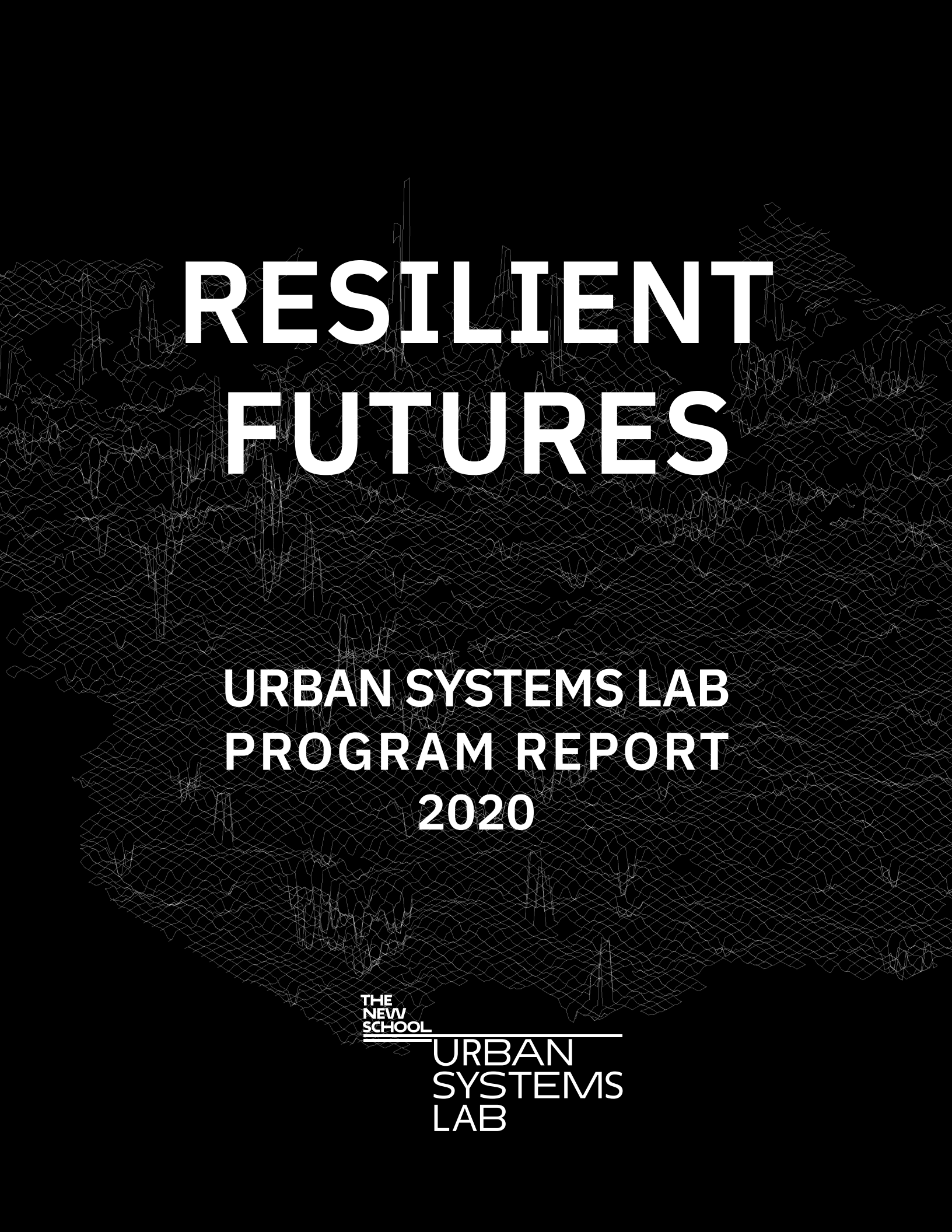


RESILIENT FUTURES

URBAN SYSTEMS LAB PROGRAM REPORT 2020

THE NEW SCHOOL
URBAN SYSTEMS LAB

ABOUT THE URBAN SYSTEMS LAB

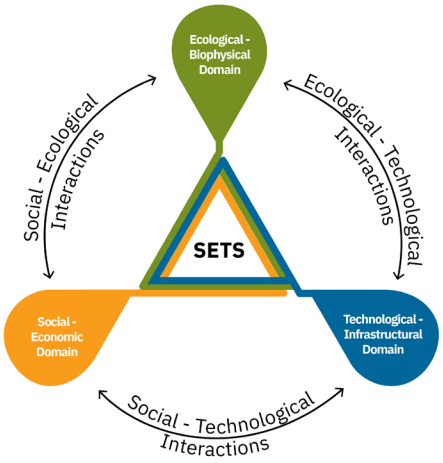
The planet is rapidly urbanizing, placing tremendous pressure on cities and urban areas to provide good and just living conditions for the majority of humanity. Ensuring a resilient and equitable future means addressing challenges of climate change, ecological degradation, and social justice simultaneously maintains Earth's biodiversity and crucial ecological processes is essential to transform cities towards sustainability.

Since 2015, the Urban Systems Lab has advanced urban systems research to support development of systemic solutions to social and environmental challenges driving inequity in urban areas. As an interdisciplinary research, design, and practice space at The New School we provide analyses, data, and insights for developing more equitable, resilient, and sustainable cities. Our work spans a variety of issues including urban climate resilience, nature-based solutions, big data and artificial intelligence, data visualization and design, urban ecology, environmental justice and equity, and urban policy and planning.

In this year-end report for 2020, learn more about how we bring together designers, urban ecologists, scientists, researchers, and policymakers with the goal to improve the lives of those most vulnerable and to enhance decision making and science communication from local to global scales.

MESSAGE FROM THE DIRECTOR

I founded the Urban Systems Lab in 2015 as an interdisciplinary research, design and practice space at The New School that examines the urban systems interactions that drive persistent patterns and challenges in cities. Our goal is to create a space that is fundamentally based on systems thinking, and that can advance qualitative and quantitative scientific methods, design and data visualization, and an urban systems theory to provide new insight into developing more equitable, resilient, and sustainable cities. The USL's impact on both a global and local level has grown quickly in a short time and has achieved national and global recognition while also providing a relevant resource for our university community across disciplines and backgrounds. The figure vision of the USL is to advance many of the areas we are currently conducting research on, but to also better leverage our vast network of community partners, City and regional stakeholders.



Timon McPhearson
Director, Urban Systems Lab
Associate Professor of Urban Ecology, The New School
Senior Research Fellow, Cary Institute of Ecosystem Studies
Associate Research Fellow, Stockholm Resilience Centre

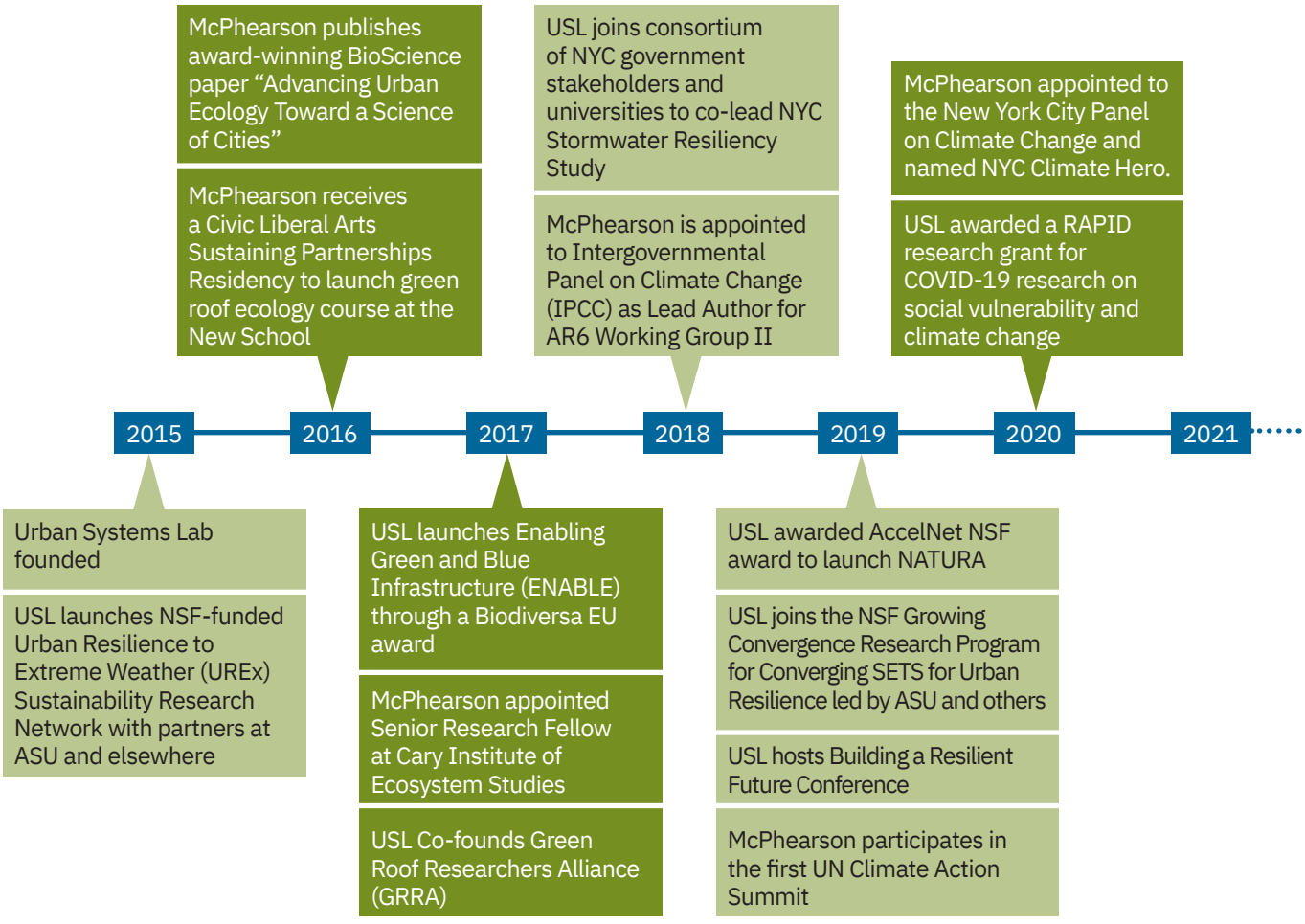
urbansystemslab.com @USL_NYC @USL_NYC

OUR WORK

USL work addresses a variety of issues including: Urban Climate Resilience, Nature-Based Solutions, Big Data & Artificial Intelligence, Community Engagement, Data Visualization & Design, Urban Ecology, Environmental Justice & Equity, and Urban Policy & Planning. As a research center, we are uniquely positioned at the intersections of design and scientific research, leveraging state of the art data science, visualization tools, and modeling techniques to better understand the future of cities - how hot they will be, where it will flood, and what solutions will impact those who need it most.

Since 2015, the USL has launched and collaborated on over 20 research efforts and design projects. Our scholarly research has been used to inform key planning and policy documents, and our USL Data Visualization Platform advances new land-use modeling techniques and risk assessments to help communities better understand future climate projections and imagine alternative and positive scenarios. Through this work we have advanced understanding of modeling resilient urban futures, green infrastructure and nature-based solutions research, heat and flood risk assessment, social vulnerability and equity dimensions of climate risk, and developing conceptual frameworks and foundation for advancing resilience research and practice.

This work is driven by observations of the siloed approaches to building resilience in cities where the social, ecological, and technological-infrastructure are so tightly entangled. The Lab's research team has published multiple papers, given a wide variety of presentations at academic conferences and workshops, and invited Keynotes on the differences between sustainability and resilience and ways to bring SETS approaches into resilience thinking and practice worldwide.

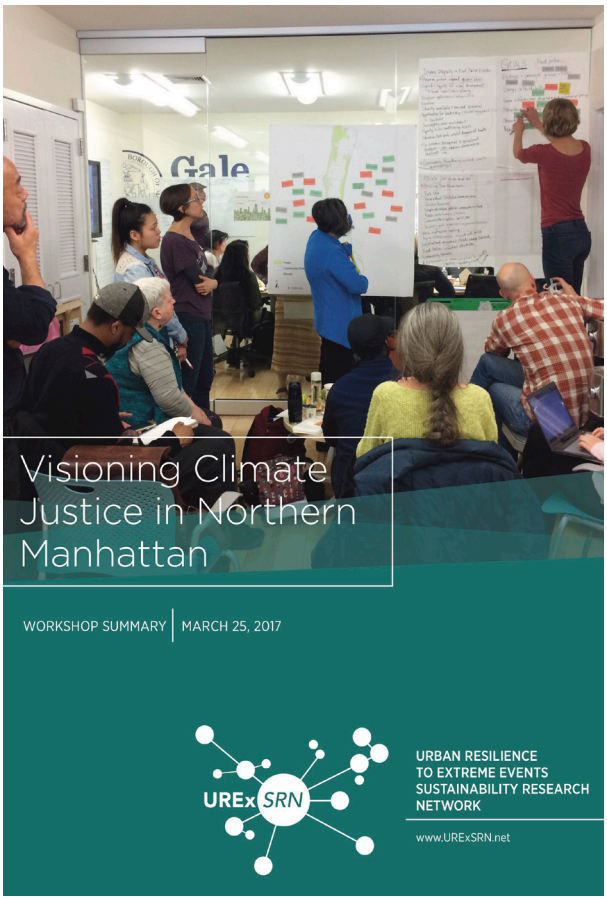


OUR WORK

Urban Resilience to Extreme Weather (UREx) Sustainability Research Network

Team: Timon McPhearson, Daniel Sauter, Ahmed Mustafa, Luis Ortiz, Katinka Wilsjman, Bart Orr, Veronica Olivotto, Claudia Tomateo, Yaella Depietri, Elizabeth Cook, Rocío Carrero (2015 - 2021)

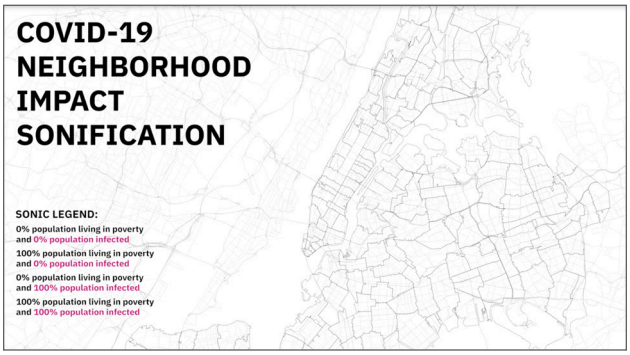
The Urban Resilience to Extremes Sustainability Research Network (UREx SRN) is a five-year project to develop an innovative set of methods to assess how infrastructure can be more resilient, provide ecosystem services, and incorporate new technologies that strengthen socio-environmental wellbeing. As part of the UREx project, USL is producing 3D visualizations that examine the equity implications of urban vulnerability. These interactive maps of nine cities integrate social, ecological, and technological data from a variety of sources.



Interdependent social vulnerability of COVID-19 and weather-related hazards in New York City

Team: Timon McPhearson, Ahmed Mustafa, Luis Ortiz, Claudia Tomateo, Pablo Herreros-Cantis (2020 - 2021)

The objective of this NSF RAPID project is to integrate survey, social media, building infrastructure, energy demand and use, and social-demographic data with simulations of potential emerging weather-related extremes to examine interdependent social vulnerability to COVID-19 and weather in NYC.



Converging Social, Ecological, and Technological Infrastructure Systems (SETS) for Urban Resilience

Team: Timon McPhearson, Ahmed Mustafa, Luis Ortiz, Jen Ventrella, Daniel Sauter (2019 - 2024)

This project is a 5 year initiative to accelerate advances in convergent urban systems science capable of providing cities with the knowledge and methods for building integrated SETS resilience strategies to extreme events, supported by cutting-edge modeling, simulation, and visualization of infrastructure systems. The project will develop and refine an urban resilience conceptual framework to guide an emerging, convergent urban systems science for cities to test and deploy in San Juan (PR), Atlanta, New York, and Phoenix.

OUR WORK

The Nature-based solutions for Urban Resilience in the Anthropocene (NATURA)

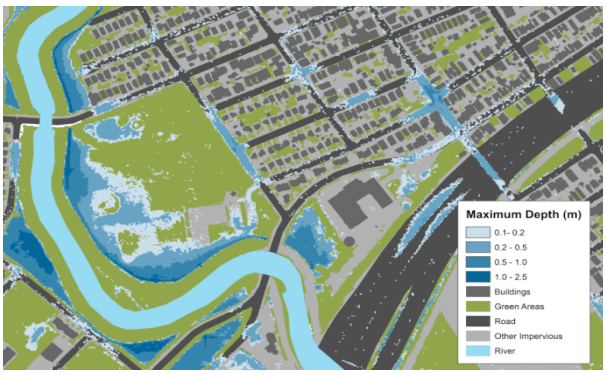
Team: Timon McPhearson, Chris Kennedy, Yeowon Kim, Elizabeth Cook (2020 - 2024)

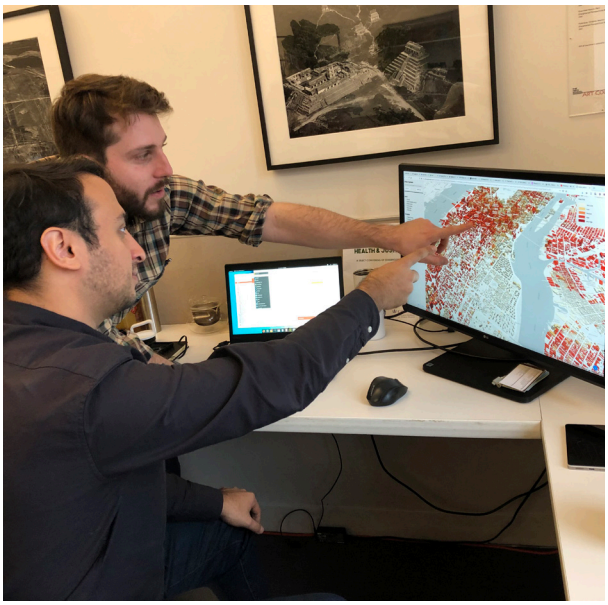
The Nature-based Solutions for Urban Resilience in the Anthropocene (NATURA) project links networks in Africa, Asia-Pacific, Europe, North and Latin America, and globally to enhance connectivity among the world's scholars and practitioners and improve the prospects for global urban sustainability. NATURA exchanges knowledge, shares data, and enhances communication among research disciplines and across the research-practice divide to advance urban resilience in face of growing threats of extreme weather events.

Environmental Justice of Urban Flood Risk and Green Infrastructure Solutions

Team: Pablo Herreros-Cantis, Elizabeth Cook, Timon McPhearson, Claudia Tomateo, Chella Strong (2019 - ongoing)

The Environmental Justice of Urban Flood Risk and Green Infrastructure Solutions project aims to better understand the environmental justice impacts of climate change related flooding on minority and low-income communities and assess social equity in green infrastructure planning for reducing urban flood risks. Through data visualization and modeling future flood risk, the project explores: Who is more exposed to flooding? And who benefits most by current green infrastructure plans or developments?





Is Green Infrastructure a Universal Good?

Team: Timon McPhearson, Z Grabowski, Pauline Munga, Chris Kennedy (2019 - 2021)

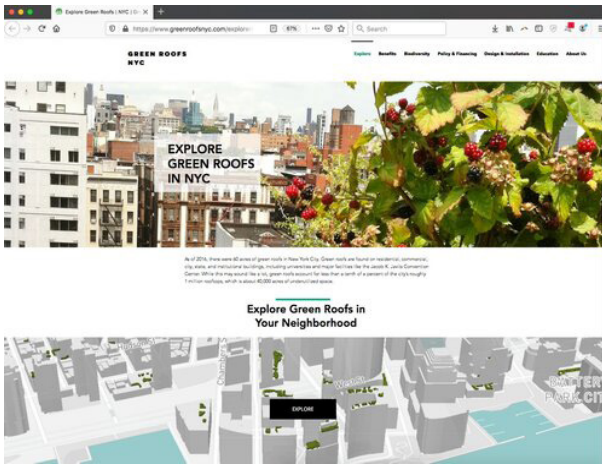
The Environmental Justice of Urban Flood Risk and Green Infrastructure Solutions project aims to better understand the environmental justice impacts of climate change related flooding on minority and low-income communities and assess social equity in green infrastructure planning for reducing urban flood risks. Through data visualization and modeling future flood risk, the project explores: Who is more exposed to flooding? And who benefits most by current green infrastructure plans or developments?

OUR WORK

Current and Future Green Roofs

Team: Timon McPhearson, Pablo Herreros-Cantis, Rositsa T. Ilieva (2017 - ongoing)

Collaborating with the NYC Audubon and the Green Roof Researchers Alliance, the USL is conducting research on the benefits of green roofs in urban areas, developing a map of current green roof locations, and real-time environmental and climatic monitoring to better understand the multiple benefits they provide.



Green Roofs NYC web platform (www.greenroofsnyc.com)

MillionTreesNYC Afforestation Study

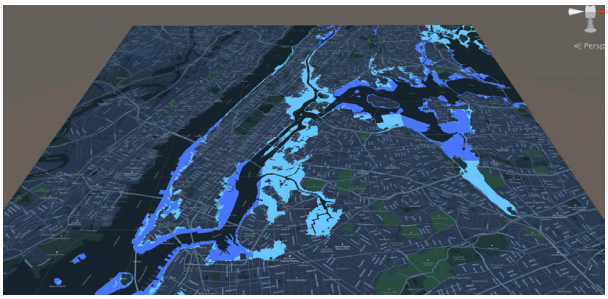
Team: Timon McPhearson, Bianca Lopez, Elizabeth Cook (2012 - Ongoing)

The MillionTreesNYC Afforestation Study is a multiyear ecological research project focused on succession, soil-plant interactions, and native-invasive species dynamics in 10 parks across New York City. The purpose is to assess the short- and long-term impacts of the MillionTreesNYC tree-planting strategy on the structure and functions of new forest ecosystems.

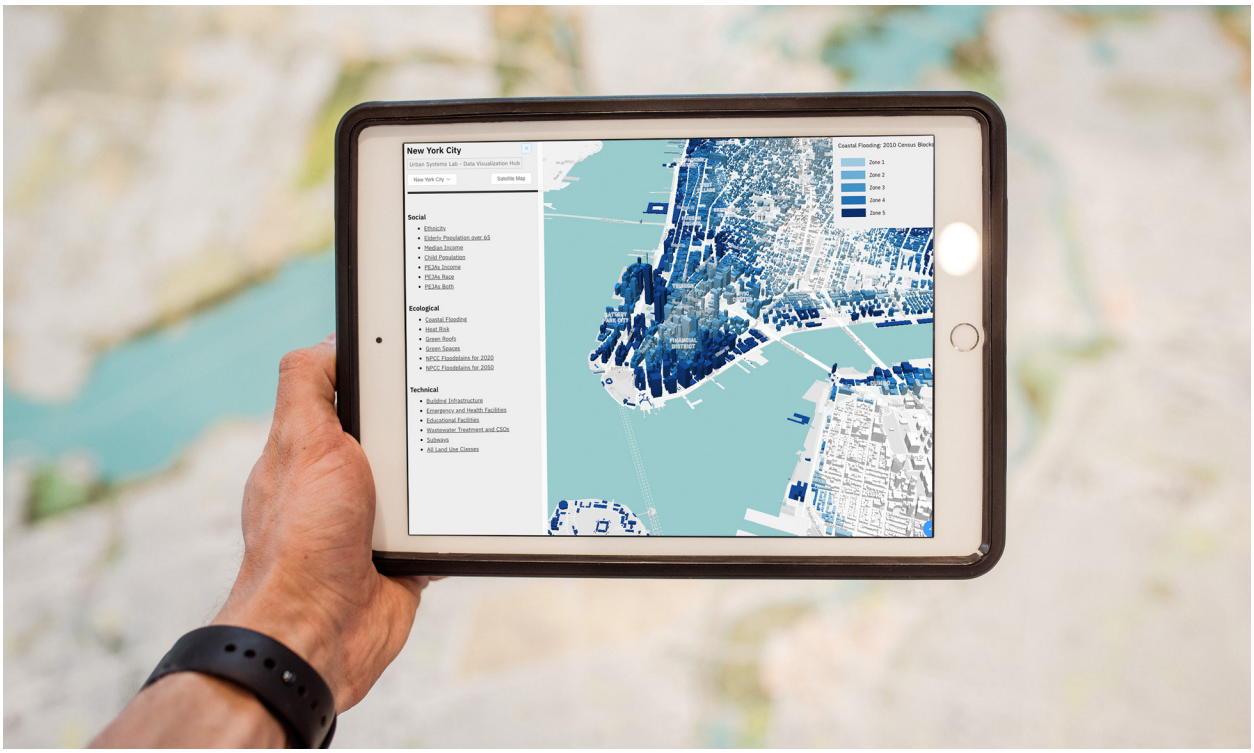
Climate Equity XR

Team: Daniel Sauter, Timon McPhearson, Saloni Shah, John Outwater, Emily Bowe, Peilu Fan, Yahnze Wu (2018 - ongoing)

Climate Equity AR is a prototype for an Extended and Augmented Reality mobile app that allow participants to explore 3D visualizations of climate risks and experiment with augmented reality layers (eg. heat maps, social vulnerability, resiliency plans) while also adding a capability to upload 'climate equity narratives'.



OUR WORK - DATAVIZ PLATFORM

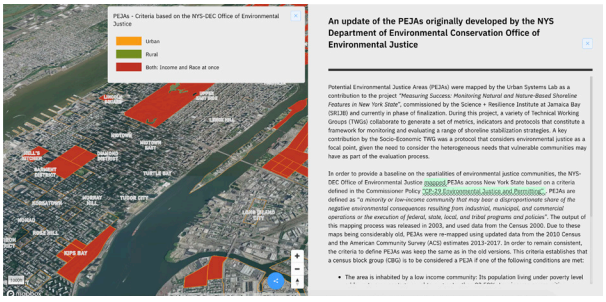


USL Data Visualization Platform

Team: Daniel Sauter, Claudia Tomateo, Joe Steele, Jaskirat Randhawa (2015 - ongoing)

The USL Data Visualization Platform is an interactive web application that visualizes Social, Ecological, and Technological Systems (SETS) data designed and implemented initially for nine different cities within the Urban Resilience to Weather-related Extremes (UREx) Sustainability Research Network. It was conceived as a tool to produce knowledge, bridging the gap between quantitative social, ecological and infrastructure data, and the rich and layered qualitative insights compiled at local stakeholder future visioning workshops.

NYC Panel on Climate Change Floodplains for 2020



Potential Environmental Justice Areas (PEJAs) in NYC

FEATURED SOCIAL - ECOLOGICAL - TECHNOLOGICAL DATA LAYERS

SOCIAL: Ethnicity, Elderly Population over 65, Median Income, Child Population, Potential Environmental Justice Areas

ECOLOGICAL: Coastal Flooding, Heat Risk, Green Roofs, Green Spaces, NPCC Floodplains for 2020 and 2050

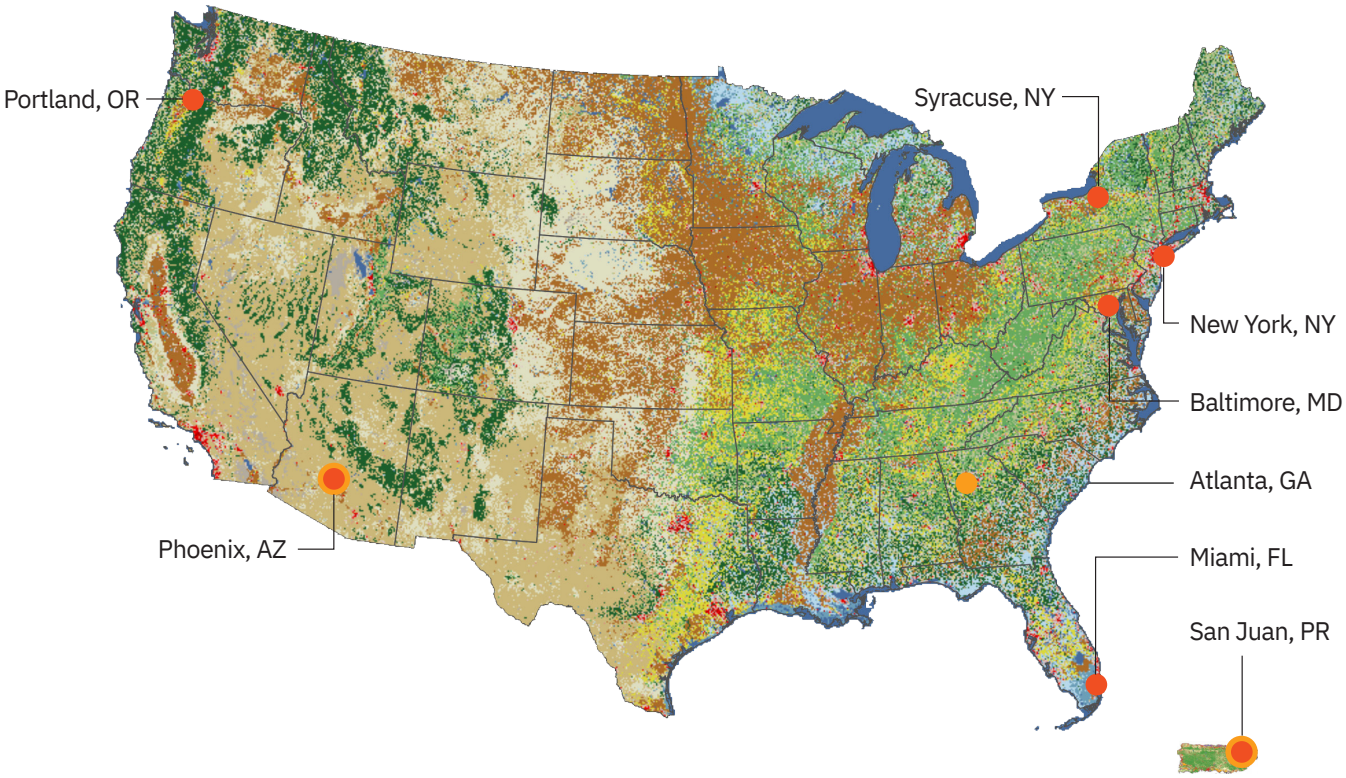
TECHNICAL: Building Infrastructure, Emergency and Health Facilities, Educational Facilities, Wastewater Treatment and CSOs, Subways

WHERE WE WORK

As part of the UREx Sustainability Research Network, and the NSF Growing Convergence Research program the USL is analyzing social, ecological, and technical systems in 9 U.S. cities to devise, analyze, and support urban infrastructure decisions in the face of climatic uncertainty.

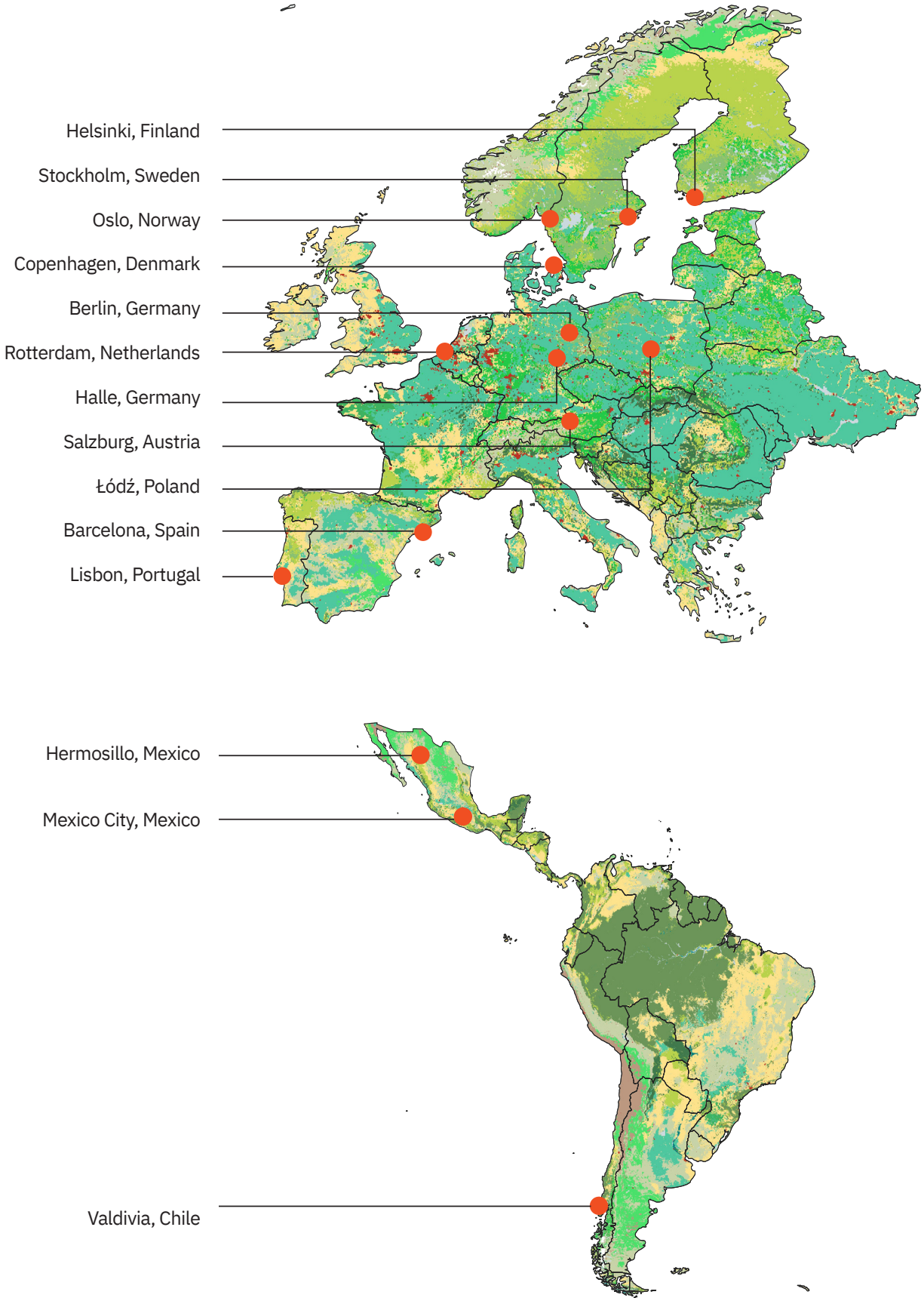
SETS CONVERGENCE — Converging Social, Ecological, and Technological Infrastructure Systems (SETS) for Urban Resilience

UREx SRN — Urban Resilience to Extremes Sustainability Research Network (UREx SRN) Cities



NYC Stormwater Resiliencey Study | Innovation Lab, scenarios workshop with community stakeholders

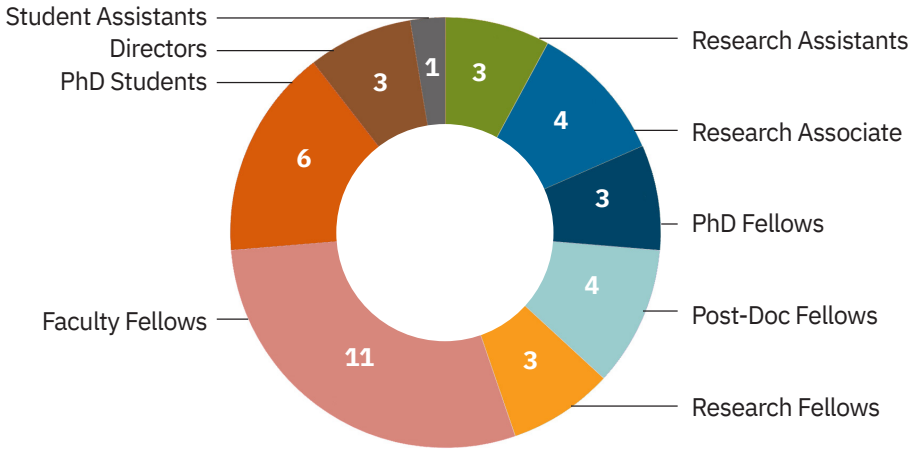
WHERE WE WORK



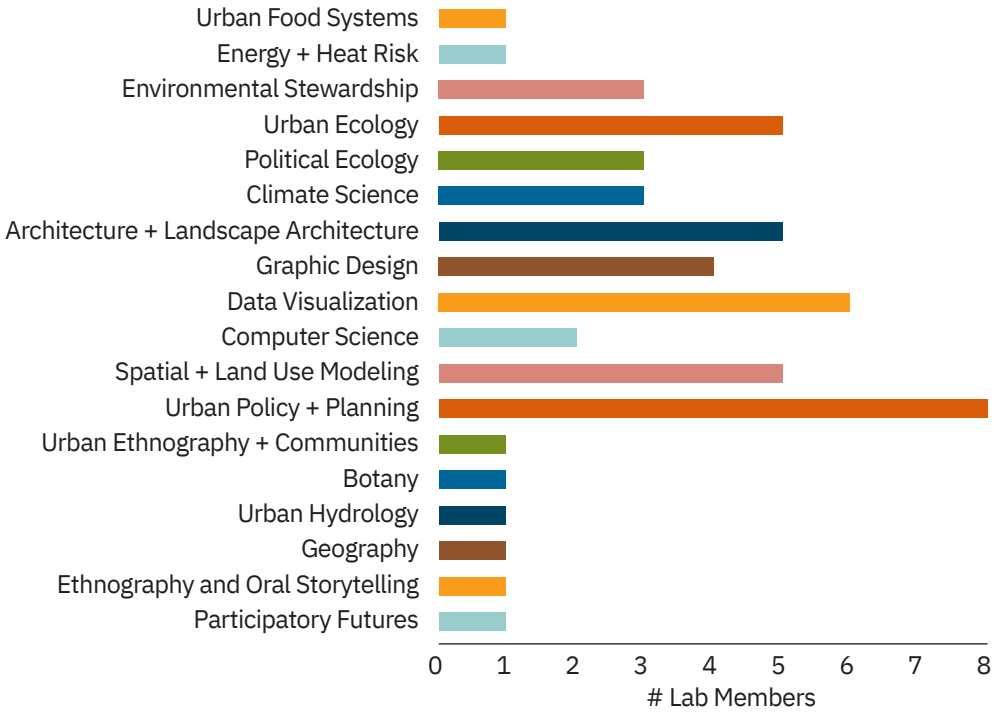
WHO WE ARE

The Urban Systems Lab was founded in 2015 by Timon McPhearson, Associate Professor of Urban Ecology at The New School in New York City. The Lab currently includes a diverse cross-section of early to mid-career researchers, designers, scientists, and technicians who have expertise in a variety of research areas. We support the work of biophysical scientists, social scientists, geographers, designers, urban policy researchers and urban ecologists. USL staff come from a wide range of backgrounds, disciplines, and areas of the world. We currently have international research fellows and associates on our team from Puerto Rico, Kenya, Spain, Peru, and Egypt, in addition to PhD students from Italy, The Netherlands, and part-time associates from China and India. The USL's makeup is more than 65% female, has been a receptive home for transgender researchers, and includes visiting and local scholars who call New York City home. The Lab's search for new staff and fellowship candidates leverages the University's commitment to equity and justice, and seeks out those with diverse backgrounds using a search model that involves faculty fellows across campus.

Positions



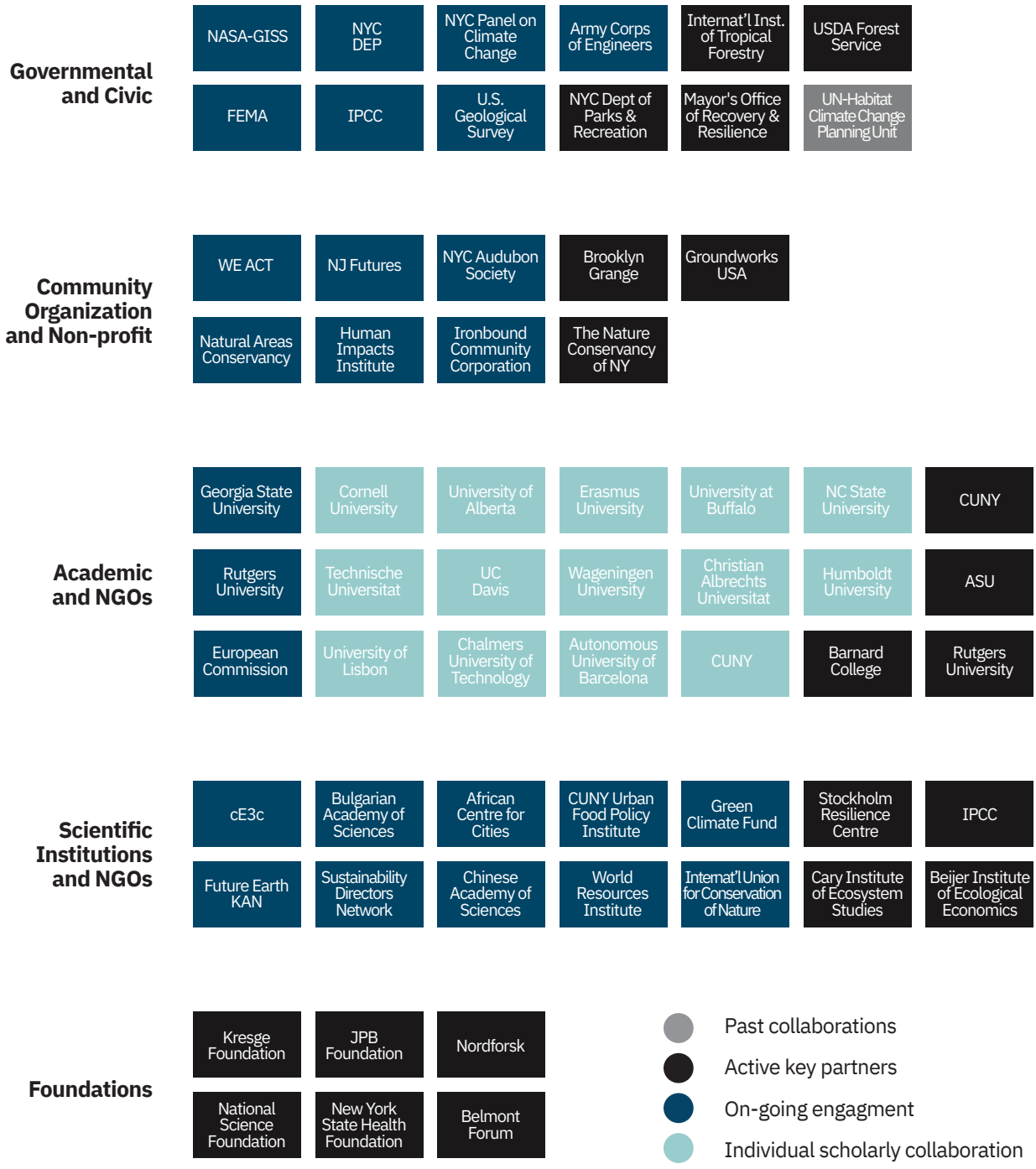
Expertise



DIVERSITY


NATIONALITY
Brazil
China
Egypt
Germany
Russia
Italy
Poland
South Korea
Spain
Ireland
USA
Peru
LANGUAGE BESIDES ENGLISH
Italian
None
Arabic
Chinese
German
Hmong
Korean
Polish
Portuguese
Russian
Spanish
French
Tibetan
Hindi
ETHNICITY
Asian
White/Caucasian
Hispanic/Latinx
Hmong
Middle Eastern/Arab
GENDER IDENITY
Male
Female
Non-binary/Queer
DIRECTOR
FACULTY FELLOW
PHD FELLOW
POST- DOC FELLOW
RESEARCH FELLOW
RESEARCH ASSOCIATE/ ASSISTANT
STUDENT ASSISTANT
USL TOTAL

PARTNERSHIPS AND COLLABORATORS



PARTNERSHIPS AND PUBLIC ENGAGEMENT

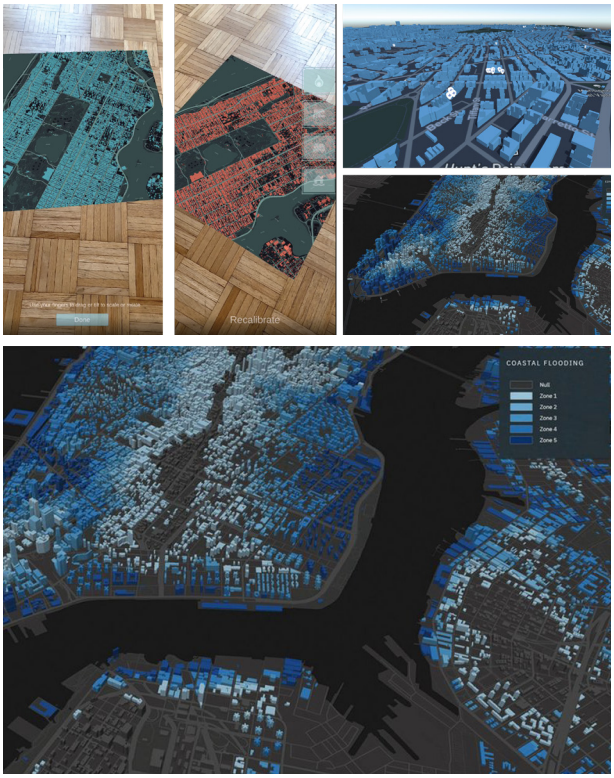
Covid-19, Social Vulnerability and Climate in NYC

In the spring of 2020, the Urban Systems Lab initiated its first analysis on the multiple social, economic, and demographic drivers of disproportionate impacts in COVID-19 cases, deaths, and severity in NYC. The Lab applied for NSF RAPID funding and was awarded $200,000 in mid-April to support our analysis which integrates survey, social media, building infrastructure, energy demand and use, and social-demographic data with simulations of potential emerging weather-related extremes to examine interdependent social vulnerability to COVID-19 and weather in NYC. The results of our preliminary research show that immediate impacts of COVID-19 fall largely along lines of race and class, and highlight the need for targeted responses to address injustice of COVID-19 cases and deaths, and importance of recovery strategies that account for differential vulnerability. Building on this initial analysis, the Lab worked with partners at the NYS Health Foundation, The Nature Conservancy of New York, and Building Healthy Communities NYC to disseminate a social survey to understand the use and perception of urban greenspaces for mental and physical health during COVID-19. The results of the survey show New Yorkers continued to use urban greenspaces during COVID, and considered them to be more important for mental and physical health than before the pandemic began. However, the study also revealed a pattern of concerns residents have related to perceived accessibility and safety which prevented some individuals from using greenspaces during the pandemic.

The Lab is continuing our effort to understand the interdependent risks of climate and social vulnerability to COVID-19 and other threats into 2021. These and other data will be used to provide critical and timely input to decision-making especially through our open and active communication with NYC and regional agencies to focus response, recovery, and resiliency efforts on those most socially vulnerable to interdependent risks of COVID-19 and weather extremes for where resources should be allocated.

Climate Equity XR

Climate Equity XR is an extendend and augmented reality (XR/AR) mobile application that leverages the Urban Systems Lab's Data Visualization Platform to present users with unique interactive geospatial maps of heat, flood risk and other climate indicators in New York City. Currently in a beta-testing phase, users can explore 3D visualizations of climate risks and experiment with augmented reality layers (eg. heat maps, social vulnerability data, resiliency plans) by projecting interactive maps and visualizations onto a physical surface. The app will also allow users to view proposed green infrastructure projects to better understand who will benefit most from these resiliency efforts. The Climate Equity XR project builds on the USL's expertise in advancing spatial agent-based modeling, machine learning, social media data, and cutting-edge visualization of urban social and infrastructure systems to ask better and new questions about key climate change risks and opportunities to advance adaptation in cities. A beta version of the application is expected to be released in the summer of 2021.



Screenshots of the Climate Equity XR Prototype

PARTNERSHIPS AND PUBLIC ENGAGEMENT

Global Research on Urban Resilience and Adaptation

In 2015, the USL became a founding member of the Urban Resilience to Extreme Weather Sustainability Research Network (UREx SRN), supported by the U.S. National Science Foundation. The objective of the UREx SRN initiative is to assemble technical knowledge about urban infrastructure and climate, to quantify interactions and feedbacks in social-ecological-technical/infrastructural system models from diverse sources of information, and support urban infrastructure decisions in the face of climatic uncertainty. Since its launch, the USL has used the UREx project as a springboard for a number of international and regional projects focused on urban resilience, climate adaptation, and equity within cities.

In 2019, we began to build upon this work through an NSF-supported project, Converging Social, Ecological, and Technological Infrastructure Systems (SETS) for Urban Resilience. As a 5-year initiative, the aim is to accelerate advances in convergent urban systems science capable of providing cities with the knowledge and methods for building integrated SETS resilience strategies to extreme events, supported by cutting-edge modeling, simulation, and visualization of infrastructure systems. The project will develop and refine an urban resilience conceptual framework to guide an emerging, convergent urban systems science for cities to test and deploy in San Juan (PR), Atlanta, New York, and Phoenix.

In the same year, the USL also launched the Nature-based solutions for Urban Resilience in the Anthropocene (NATURA) project with partners at Arizona State University. The project links networks in Africa, Asia-Pacific, Europe, North, and Latin America to enhance connectivity among the world's scholars and practitioners on applications in nature-based solutions and to advance urban resilience in face of growing threats of extreme weather events. Since it's launch this global network of networks has grown from 26 to 38.

Tischa Munoz-Erickson co-leads a UREx Community Visioning workshop

NATURA

NATURA Network of Networks map

PARTNERSHIPS AND PUBLIC ENGAGEMENT

USL Research Used to Support Testimony on Green Space Equity at NYC Council Hearing

The USL's research on the use and perception of urban parks and open spaces during COVID-19 in NYC is being used to support testimony from The Nature Conservancy of New York's Emily Maxwell during the NYC City Council Oversight Committee hearing on "Improving the Equity of Green Space throughout the City in Light of the COVID Epidemic."

NYC Cool Neighborhoods Program / NYC Urban Heat Island Task Force

From 2016-2018 the USL's Timon McPhearson served on the NYC Mayor's Office Urban Heat Island Task Force. This work included providing analysis and advising on policy and planning for reducing heat and heat risk in the city. The work culminated in the $100 million NYC Cool Neighborhoods plan, a "comprehensive approach to keep communities safe in extreme heat." The plan includes a mix of interventions from additional tree planting for cooling in high heat risk neighborhoods to "be a buddy" systems for building social cohesion and accountability during heat waves events, which are predicted to increase with climate change in the NYC region.

Building a Resilient Future Conference

In the fall of 2019, the USL partnered with the Global Resilience Partnership to organize a day long conference ahead of the UN Climate Action Summit to discuss ambitious and transformative actions needed to build resilience. The event featured innovative, interactive and participatory sessions for participants to share the actions and commitments they are making to achieve a transformative and resilient future. The USL's research team presented a number of projects throughout the conference which was attended by over 800 participants from around the world.

NYC Urban Forest Taskforce

Since 2018, the USL has participated in the Nature Conservancy of New York's Urban Forest Task Force. The Task Force was established to develop a vision for a healthy, biodiverse, robust, accessible, and resilient urban forest that justly and equitably delivers its multiple benefits to all residents of New York City and helps NYC adapt to and mitigate climate change. As a member of the research and Evaluation Working Group, the USL is working together with over 50 partner organizations to identify effective and lasting policies, plans, practices, research, and investments needed to protect, maintain, use, monitor, characterize, promote and expand the New York City urban forest to ensure its benefits accrue across all stages of the lifecycle of NYC's trees. The Taskforce plans to release its Urban Forest Agenda in the spring of 2021.

PARTNERSHIPS AND PUBLIC ENGAGEMENT

Green Roof Ecology Course

In 2017, USL's Timon McPhearson developed a Green Roof Ecology course that links urban ecology, urban planning and urban design through a civic engagement project with community partners building, designing, and managing green roofs in NYC. The course examines specific social, ecological and environmental aspects of urban green roofs and participatory research design techniques in partnership with Brooklyn Grange, a worldwide pioneer in rooftop farming with large-scale green roofs in Brooklyn and Queens. Now in its X year, this intensive studio and field-based course allows for building the knowledge base for planning and designing improved functionality, beauty, and social and environmental features that benefit both human and non-human species. Past students have developed a dedicated website, and design and planning projects that links designers with data analysis to assess green roof benefits while developing design solutions and planning materials for advocating for improved green roofs investment through city planning and policies.

Green Roof Legislation in NYC

The USL's research on green roofs as green infrastructure for climate resilience and social equity played a key role in helping to pass NYC Local Laws 92 and 94, which went into effect on November 15, 2019, requiring all new buildings and major roof alterations to be capped with a green roof, solar panels, or some combination of the two. The Laws were part of the New York City Council's climate legislation package focused on buildings, which are responsible for almost three quarters of all local emissions (Climate Mobilization Act, Local Law 97). In hearings leading up to the legislation the USL's research in collaboration with The Nature Conservancy was part of documentation and verbal comments based on our work for the law.

Student green wall design for Vice Media headquarters in Brooklyn

USL RESEARCH FELLOWSHIP

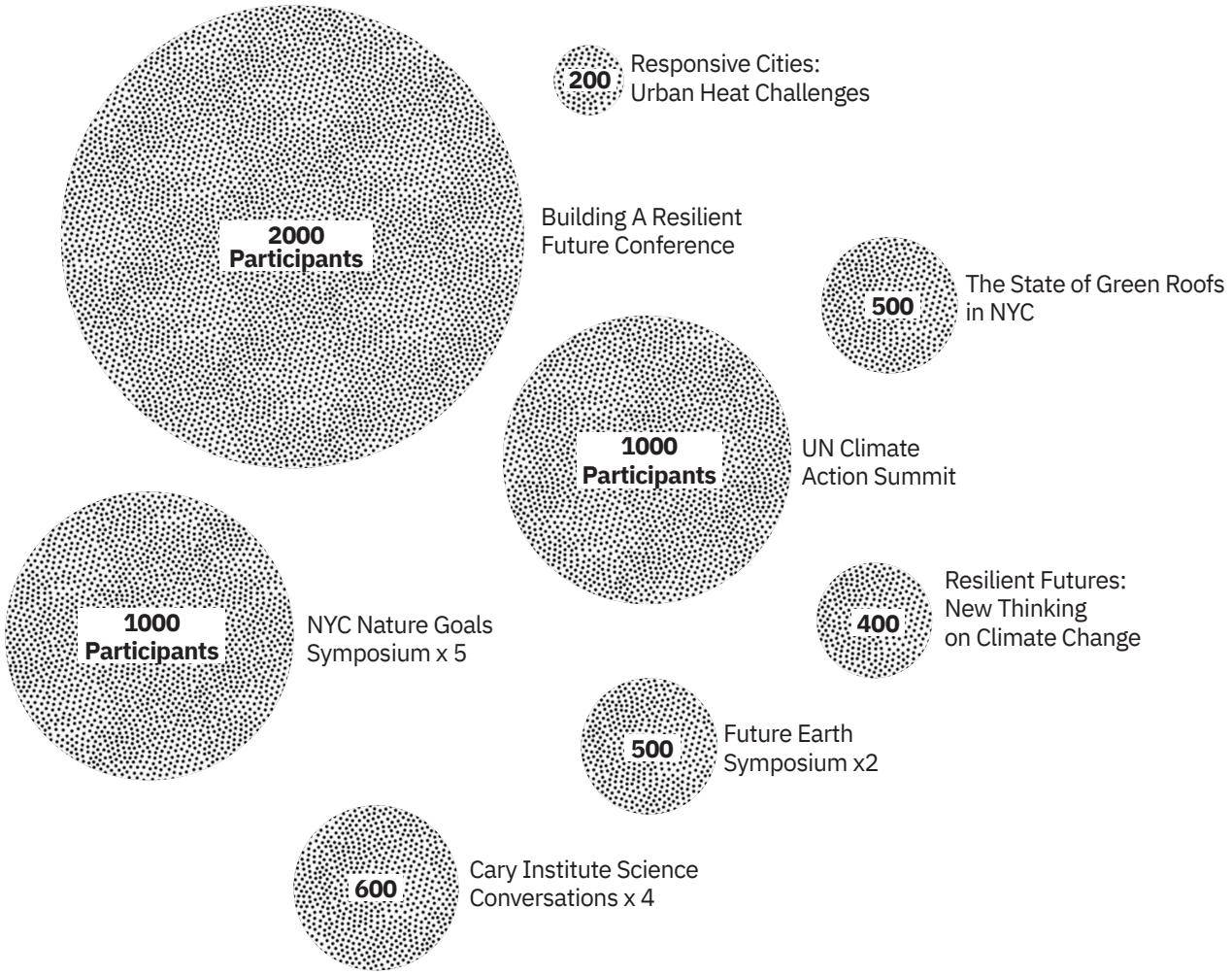
Graphic by USL Faculty Fellow Chris Woebken for a virtual exhibition and roundtable, Post-Petro Imaginaries at 1014 gallery in NYC.

In 2019, the USL launched a Research Fellowship Program to support scholarly activity that further the USL's commitment to providing new insight into developing more equitable and resilient cities. The fellowships support collaboration and independent research from New School faculty and PhD students that draws from empirical and theoretical approaches as well as design and data visualization to advance urban systems research and practice. Thus far over $25,000 in Fellowship funding has been awarded to seven faculty fellows and six PhD fellows.

EVENTS, LECTURES AND CONFERENCES

Members of the USL give lectures, presentations, panels, webinars, and provide scientific input to various events and workshops. Highlights include Director Timon McPhearson's Keynote presentations for the Barry Commoner Lecture at Marymount Manhattan College, Elon University Voices of Discovery Series, Helsinki Institute of Sustainability Science (HELSUS) and the Finnish Environment Institute, Chinese Academy of Sciences, Dutch Research Institute for Transitions, Cary Institute of Ecosystem Studies, Columbia University, International Forum on Urbanism, Natural Capital Symposium at Stanford University, at the Sorbonne in Paris, at UN Habitat III in Quito; KOSMOS Dialogue at Humboldt University in Berlin, and others. Dr. McPhearson has also provided invited lectures recently at University College London, MIT, Princeton University, Cornell University, Columbia University, University of Pennsylvania, Hamilton College, The Nature Conservancy, Finish Cultural Institute, Swedish General Consulate, Stockholm Resilience Center, and more.

USL members regularly give presentations at national and international conferences. These include the Ecological Society of America Annual Meeting, American Meteorological Society Annual Meeting, American Geophysical Union, American Association of Geographers, Green Roof Researchers Alliance, International Sustainability Science Conference, Resilience, Infrastructure Conference, Urban Transitions Global Summit, Adaptation Futures Conference, Complex Systems Symposium, Programme on Ecosystem Change and Society, The Nature of Cities Summit, and UREx Sustainability Research Network All Hands Meeting among others.



PRESS HIGHLIGHTS FROM 2020

The USL's work has been featured in the following news outlets: The Guardian, NY Times Magazine, NY Times, Popular Science, Urban Omnibus, Future Earth, Curbed NY, The Village Voice, CityLab, Nature, PNAS News, Nature Sustainability, Science Daily, Huffington Post, FCitiscope, Pulitzer Center, Christian Science Monitor, Stockholm Resilience Centre, SciencelineASU Now, New School Radio, Science News, Revolve Magazine, Elon News Network, Nature Research Sustainability, New School News, Energy News Network, Eco-Business, India Climate Dialogue, Real News, Reuters, Place, New Geography, NYC Mayor's Office among others.

Our Future on Earth
February 2020

USL Director Timon McPhearson is now on the Advisory Council for the World Resources Institute, Ross Center for Sustainable Cities. Future Earth has just released its latest report, Our Future on Earth 2020 and the launch of Global Risk Perception report. The Our Future on Earth report includes a section co-authored by USL Director Timon McPhearson and touches on a range of interconnected topics from the climate crisis, to food and financial security, populism and grassroots movements, to the challenges and opportunities of new media and the digital revolution.

"We have all these shared vulnerabilities from the [COVID-19] itself, but we also have the ways that the actions that we take to decrease risks from the disease transmission interact with other vulnerabilities that we have here in the city. We're very interested in how the current shift in where people are and how they work or not work is changing how we consume energy"

- USL's Luis Ortiz in "Making Science Actionable", Urban Omnibus

Green Roof Researchers Alliance
March 2020

Dustin R. Partridge and Danielle Spiegel-Feld from the Green Roof Researchers Alliance (GRRA) discuss NYC's new Climate Mobilization Act which includes Local Laws 97, 92 and 94, requiring all new buildings and major roof alterations to be capped with a green roof, solar panels, or some combination of the two. As of 2016 there were only 736 green roofs in the city, representing less than 0.1% of its buildings. The USL is working with partners at the GRRA, The Nature Conservancy, The Brooklyn Grange and Audubon Society to change this.

Urban Omnibus
April 2020

USL Research Fellow Luis Ortiz, Director Timon McPhearson and Assistant Director Chris Kennedy talk with the Architectural League's Urban Omnibus on recent COVID-19 research in NYC.

"Parks should be seen as critical infrastructure in the city—and that word is an important one because we don't tend to think of parks and open space as critical infrastructure; we think of internet services and fuel supply and transportation as critical infrastructure, not parks and open space"

- Timon McPhearson in NYC "Parks foresee financial losses at a time when we need them the most" Curbed NY

Curbed NY
May 2020

USL Director Timon McPhearson contributes commentary to a recent Curbed NY article exploring funding cuts for urban parks and organizations that help maintain open spaces in New York City.

PRESS HIGHLIGHTS FROM 2020

Popular Science June 2020

USL Director Timon McPhearson is featured in Popular Science's recent coverage of a new National Wildlife Federation report, , just released on the role nature-based solutions can play in safeguarding communities from extreme weather like hurricanes. McPhearson was also interviewed for an article in the Guardian on the important role urban nature plays during the COVID-19 crisis, and also in a new piece in Curbed New York, on the interdependent threats of extreme heat and its disproportionate impact on already vulnerable populations. USL Director Timon McPhearson was appointed to the NYC Panel on Climate Change. Dr. McPhearson joins a 20-member independent advisory body that synthesizes scientific information on climate change and advises City policymakers on local resiliency and adaptation strategies to protect against rising temperatures, increased flooding, and other hazards.

"In many cases, what we have built over the last 50 or 100 years has been infrastructure designed to meet a storm of a certain magnitude, so, when that magnitude is exceeded it fails, and it fails catastrophically."

- Timon McPhearson in "Healthy ecosystems are nature's barrier to hurricane damage," Popular Science

NYC Mayors Office Recovery Data Partnership July 2020

The Urban Systems Lab joins the NYC Mayors Office Recovery Data Partnership to share data with the City to aid in COVID-19 response and recovery efforts. The USL will be sharing data from our social survey, "Perception and Use of Urban Parks and Open Space During COVID-19 Social Distancing in New York City", which explores among other things access and use of urban parks and open spaces in NYC during COVID-19.

Oculus Magazine August 2020

The USL's research on the impacts of COVID-19 on New York's transportation system is featured in the latest issue of the American Institute of Architects Oculus magazine.

"We have not come to terms with the real cost of what solutions for building resilience to climate change look like," said Timon McPhearson... "The fact that nature is going to cost money to invest in should not be surprising to us."

-NYC's Trees: A Natural Defense Against Heat, But Not Equally Shared, Science Friday

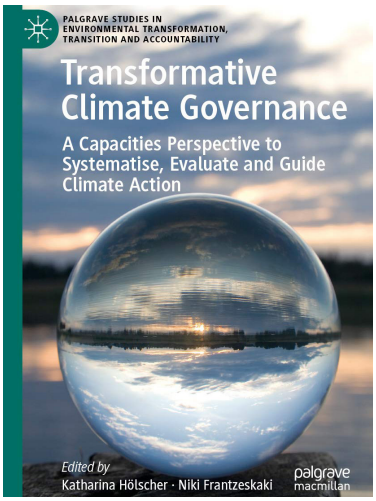
Science Friday, September 2020

The USL's Timon McPhearson and Luis Ortiz are featured in this week's Science Friday episode in a segment called "NYC's Trees: A Natural Defense Against Heat, But Not Equally Shared." Timon and Luis discuss ongoing research in the Lab examining the importance of the urban forest and urban greenspaces in NYC for building resilience to extreme heat, climate change and COVID-19.

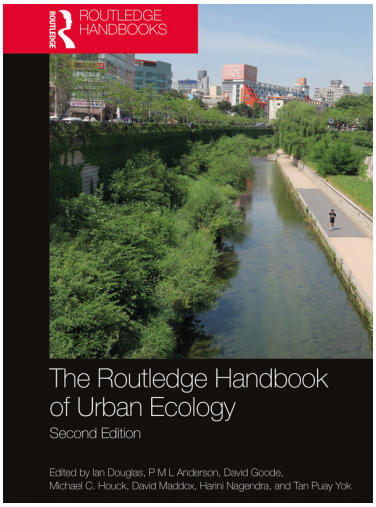
Science Magazine, December 2020

The USL's Timon McPhearson was quoted in a new Science Magazine article, "Human 'stuff' now outweighs all life on Earth" by Erik Stokstad discussing a study from the Weizmann Institute of Science that concludes the mass of all human-made stuff - buildings, roads, and everything else —now exceeds the weight of all living things on the planet.

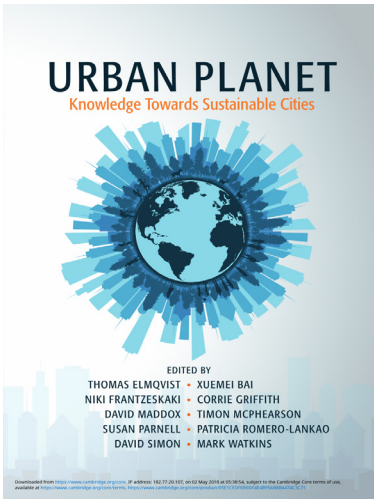
FEATURED PUBLICATIONS - BOOKS



Transforming Cities and Science for Climate Change Resilience in the Anthropocene.
McPhearson, T. (2020). In K. Hölscher & N. Frantzeskaki (Eds.), Transformative Climate Governance: A Capacities Perspective to Systematise, Evaluate and Guide Climate Action (pp. 99–111). Springer International Publishing.

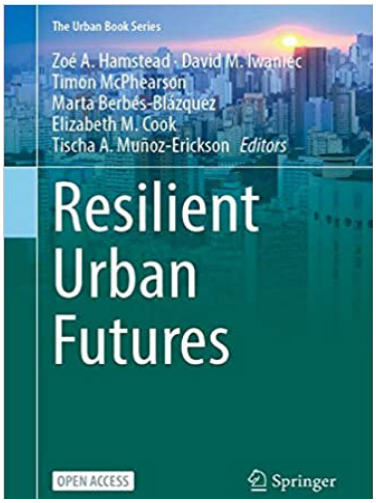


A Transdisciplinary Urban Ecology Approach to Complex Urban Systems
Cook, E.M., and McPhearson, T. (2020). In Ian Douglas, P M L Anderson, David Goode, Michael C. Houck, David Maddox, Harini Nagendra, Puay Yok Tan (Eds.), The Routledge Handbook of Urban Ecology. Routledge Publishing.



Urban Planet: Knowledge Toward Sustainable Cities
Editors: Elmqvist, Thomas, Xuemei Bai, Niki Frantzeskaki, Corrie Griffith, David Maddox, Timon McPhearson, Sue Parnell, Paty Romero-Lankao, David Simon, and Mark Watkins (eds). 2018

Urban Planet takes an integrative look at our urban environment, bringing together scholars from sociology and political science to evolutionary biology, geography, economics and engineering. It includes perspectives of often neglected voices: architects, journalists, artists and activists. The book connectS challenges and solutions on a local scale with drivers and policy frameworks on a regional and global scale.



Resilient Urban Futures
Editors: Hamstead, Z.A., Iwaniec, D.M., McPhearson, T., Berbés-Blázquez, M., Cook, E.M., Munoz-Erickson, T.A. (Eds.), 2021.
This open access book addresses the way in which urban and urbanizing regions profoundly impact and are impacted by climate change. The editors and authors show why cities must wage simultaneous battles to curb global climate change trends while adapting and transforming to address local climate impacts.

FEATURED PUBLICATIONS - JOURNALS

The USL published work in a wide range of peer-review journals including: Nature, Ecology and Society, Environmental Science & Policy, Frontiers in Ecology and the Environment, The Nature of Cities, Current Opinion in Environmental Sustainability, Landscape and Urban Planning, Nature Sustainability, BioScience. USL member authors called out in bold text.

PUBLICATIONS	
Books	5
Journal Articles	136
Journal Articles in review	1
Book Chapters	18
Other scholarly writing	25
STATISTICS	
Citations	8384
H-Index	65

SELECTED MANUSCRIPTS 2020-2019

Herreros-Cantis, Pablo, Veronica Olivotto, Zbigniew Grabowski, and Timon McPhearson. 2020. "Shifting Landscapes of Coastal Flood Risk: Environmental (In)Justice of Urban Change, Sea Level Rise, and Differential Vulnerability in NYC." Urban Transformations 2:9. https://doi.org/10.1186/s42854-020-00014-w

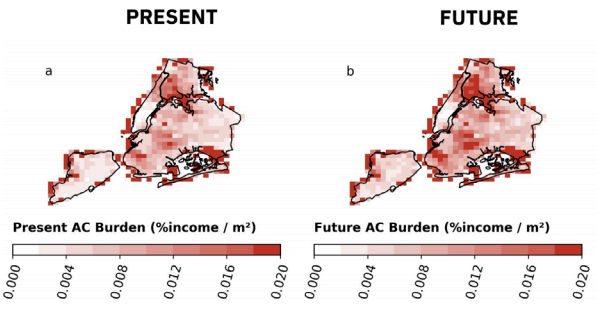
Mustafa, Ahmed, Bruwier, M., Maravat, C., Teller, J., Pirotton, M., Erpicum, S., Archambeau, P., & Dewals, B. (2020). Influence of urban forms on surface flow in urban pluvial flooding. Journal of Hydrology, 582. https://doi.org/10.1016/j.jhydrol.2019.124493

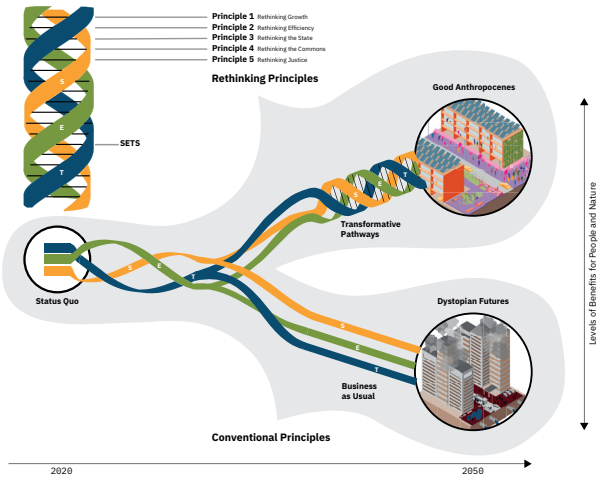
Filipa Grilo, Pedro Pinho, Cristiana Aleixo, Cristina Catita, Patrícia Silva, Nuno Lopes, Catarina Freitas, Margarida Santos- Reis, **Timon McPhearson,** Cristina Branquinho. (2020). Using green to cool the grey: Modelling the cooling effect of green spaces with a high spatial resolution. Science of The Total Environment. https://doi.org/10.1016/j.scitotenv.2020.138182

Langemeyer, Johannes, Diego Wedgwood, **Timon McPhearson**, Francesc Baró, Anders L Madsen, David Barton. "Creating nature-based solutions where they are needed - a spatial ecosystem service-based decision analysis of green roof potentials in Barcelona," Science of the Total Environment, 707. https://doi.org/10.1016/j.scitotenv.2019.135487

Andersson, Erik, Johannes Langemeyer, Sara Borgström, **Timon McPhearson**, Dagmar Haase, Jakub Kronenberg, David N. Barton, McKenna Davis, Sandra Naumann, Lina Röschel, Francesc Baró. 2019. "Enabling Urban Green and Blue Infrastructure to Improve Contributions to Human Well-being and Equity in Urban Systems." BioScience, https://doi.org/10.1093/biosci/biz058

Ortiz, Luis E., Jorge E. González, Radley Horton, Wuyin Lin, Wei Wu, Prathap Ramamurthy, Mark Arend, Robert D. Bornstein. 2019. "High-Resolution Projections of Extreme Heat in New York City." International Journal of Climatology, https://doi.org/10.1002/joc.6102





FEATURED PUBLICATIONS - JOURNALS

Creutzig, Felix, Steffen Lohrey, Xuemei Bai, Alexander Baklanov, Richard Dawson, Shobhakar Dhakal, William F. Lamb, **Timon McPhearson,** Jan Minx, Esteban Munoz, Brenna Walsh. 2019. "Upscaling urban data science for global climate solutions." Global Sustainability 2, e2, 1-25, https://doi.org/10.1017/sus.2018.16

Depietri, Yaella, Khila Dahal, Timon McPhearson. 2018. "Multi-hazard risk in a coastal megacity." Natural Hazards and Earth Systems Sciences 18:3363-3381, https://doi.org/10.5194/nhess-18-3363-2018

Depietri, Yaella, Timon McPhearson. "Changing urban risk: 140 years of climatic hazards in New York City." Climatic Change 148:95-108, https://doi.org/10.1007/s10584-018-2194-2

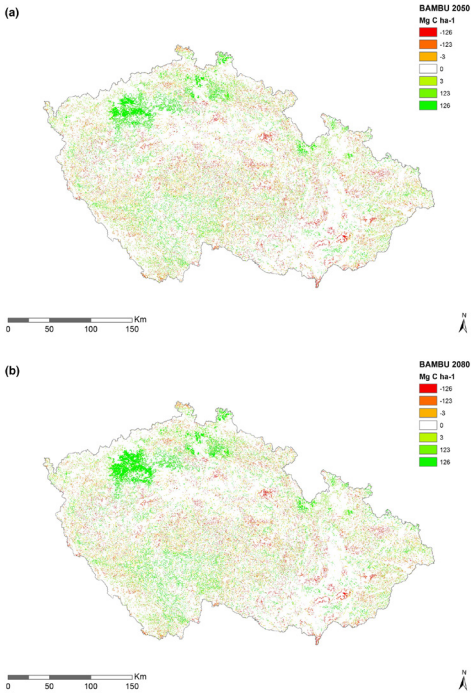
Z. J. Grabowski, Matsler A., Thiel C., McPhillips L., Hum R., Bradshaw A., Miller T., & Redman, C. Infrastructures as Socio-Eco-Technical Systems: Five Considerations for Interdisciplinary Dialogue. J. Infrastruct. Syst., 2017, 23(4): 02517002. 10.1061/(ASCE)IS.1943-555X.0000383.

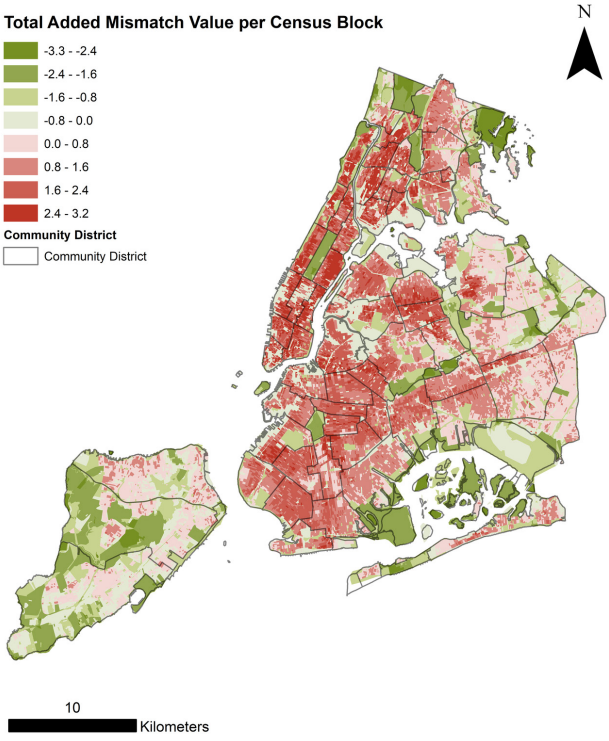
McPhearson, Timon, David Iwaniec, Xuemei Bai. "Positives visions for guiding transformations toward desirable urban futures." Current Opinion in Environmental Sustainability (Special Issue), doi:10.1016/j.cosust.2017.04.004

McPhearson, Timon, Sue Parnell, David Simon, Owen Gaffney, Thomas Elmqvist, Xuemei Bai, Debra Roberts, Aromar Revi. 2016. "Scientists must have a say in the future of cities." Nature, 538:165-166

Kremer, Peleg, Zoé A. Hamstead**, Timon McPhearson.** 2016. "The Value of Urban Ecosystem Services: A Spatially Explicit Multicriteria Analysis of Landscape Scale Valuation Scenarios in NYC." Environmental Science & Policy (Special Issue), doi:10.1016/j.envsci.2016.04.012

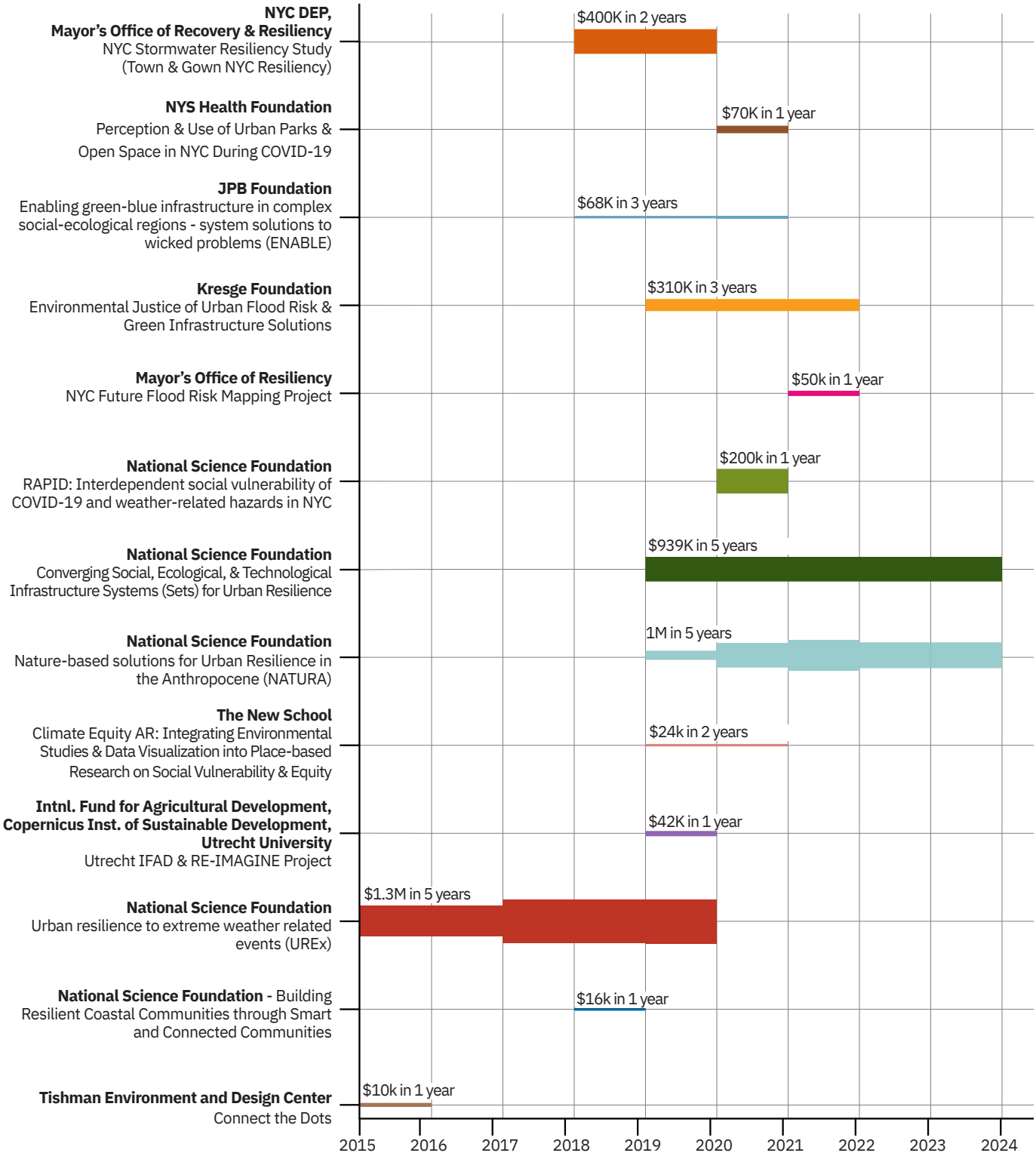
McPhearson, Timon, Steward T.A. Pickett, Nancy Grimm, Jari Niemelä, Marina Alberti, Thomas Elmqvist, Christiane Weber, Dagmar Haase, Jürgen Breuste, Salman Qureshi. 2016. "Advancing Urban Ecology Toward a Science of Cities." BioScience, https://doi.org/10.1093/biosci/biw002





FUNDING

The Urban Systems Lab receives generous support from The New School, The Kresge Foundation, The Cary Institute of Ecosystem Studies, The U.S. National Science Foundation, New York State Health Foundation, NordForsk, Biodiversa, The City of New York and the Belmont Forum, among others. Since 2015, the USL has received over $8 Million to support cutting edge research and urban systems science.



CURRENT AWARDS

AWARD	DURATION	FUNDER	USL AMOUNT	TOTAL AWARD FOR PRIMARY INSTITUTION
NSF INTERN: Convergence science for climate resilience planning in NYC (Non-Academic Research Internships for Graduate Students)	2021-2022	National Science Foundation	$54,187	
NYC Future Flood Risk Mapping project	2021 - 2022	Mayor's Office of Resiliency	$50,000	$500,000
SMARTer Greener Cities: Making Smart Cities Smarter and More Liveable through Nature-based Solutions	2020 - 2022	Nordforsk (Norwegian Research Council)	In Kind	$11,545,246
Perception and Use of Urban Parks and Open Space in NYC During COVID-19 Social Distancing	2020 - 2021	NYS Health Foundation	$70,000	
RAPID: Interdependent social vulnerability of COVID-19 and weather-related hazards in New York City	2020 - 2021	National Science Foundation	$200,000	
Converging social, ecological, and technological infrastructure systems (SETS) for urban resilience	2019 - 2024	National Science Foundation	$938,991	$3,600,000
Environmental Justice of Urban Flood Risk and Green Infrastructure Solutions	2019 - 2021	Kresge Foundation	$310,000	
Nature-based solutions for Urban Resilience in the Anthropocene (NATURA)	2019 - 2024	National Science Foundation	$968,254	$2,000,000
Climate Equity AR: Integrating Environmental Studies and Data Visualization into Place-based Research on Social Vulnerability and Equity	2019 - 2021	The New School	$24,000	
Utrecht IFAD and RE-IMAGINE Project	2019	Internat'l Fund for Agricultural Development, Copernicus Inst. of Sustainable Development, Utrecht University	$42,372	
Green Roof Researchers Alliance (GRRA)	2018 - 2019	New York Community Trust	$399,703	$60,000
NYC Stormwater Resiliency Study (Town and Gown NYC Resiliency)	2018 - 2020	NYC Dept. of Environmental Protection and Mayor's Office of Recovery and Resiliency	$16,000	$1,800,000
Building Resilient Coastal Communities through Smart and Connected Communities	2017 - 2019	National Science Foundation	$67,530	$1,500,000
Is Green Infrastructure a Universal Good?	2018 - 2021	JPB Foundation	$3,000,000	
Enabling green-blue infrastructure in complex social-ecological regions - system solutions to wicked problems (ENABLE)	2016 - 2020	Biodiversa and European Commission	In Kind	$12,151,904
Urban resilience to extreme weather related events (UREx)	2015 - 2020	National Science Foundation	$1,018,009	
Connect-the-Dots	2015	Tishman Environment and Design Center	$10,000	
Total			**$7,064,859**	**$33,157,150**

CURRENT USL MEMBERS

Staff

Timon McPhearson
Director

Daniel Sauter
Associate Director

Chris Kennedy
Assistant Director

Claudia Tomateo
Research Fellow

Pauline Munga
Research Fellow

Pablo Herreros
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Joe Steele
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Chella Strong
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Emily Bowe
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Yeowon Kim

Luis Ortiz

Ahmed Mustafa

Zbigniew Grabowski

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Filipa Grilo

Bart Orr

Avigail Vantu

Katinka Wijsman

Jen Ventrella

Belen Fodde

Rory Curtin

Audrey Jenkins

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