Edition #15

October 2024

>>> NEWSLETTER <<<

NASA Equity & Environmental Justice

EEJ NEWS

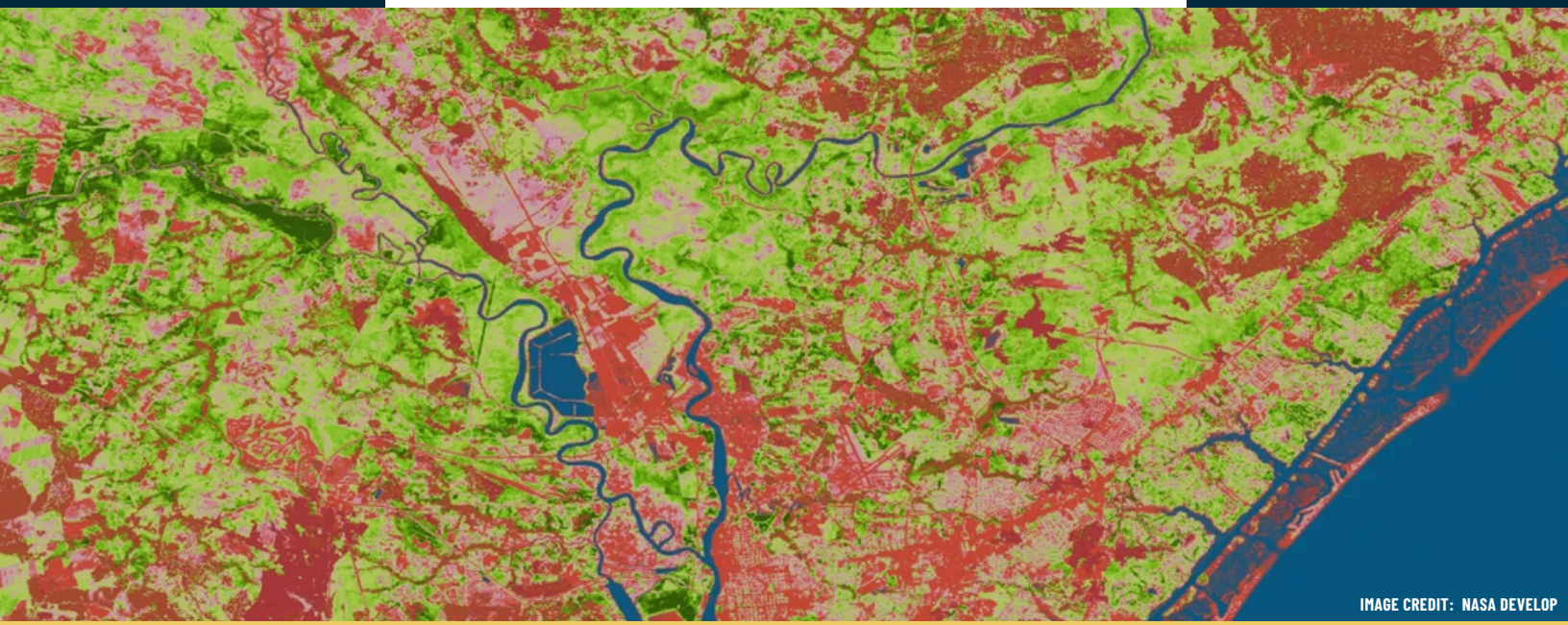


IMAGE CREDIT: NASA DEVELOP

>>> WELCOME TO OUR 2024 ROSES PROJECTS! <<<

In 2023, NASA released the **Earth Action: Community Action for Equity and Environmental Justice NASA Research Announcement (NRA, ROSES-2023 NNH23ZDA001N-EEJ)**. This NRA solicited proposals to address equity and environmental justice (EEJ) priorities through the creation of **geospatial tools** that integrate Earth science and socio-economic information and with a focus on local solutions that are **co-created** with community partners to **inform decisions, actions, and policies**. NASA received 51 proposals and **selected 10 proposals**, described below, for a total funding of **$2.2 million per year for 3 years**. Each selected proposal was developed in collaboration with underserved and overburdened communities and will address the following three components: 1) Assessment and Consultation, 2) Tool Design, Test, and Implementation, and 3) Evaluation and Capacity Building.

Continue reading to learn more about each selected proposal!

More details are available HERE

Advancing Environmental Justice in Atlanta through GIS-Enabled Community Engagement

Team Members: Christine Ekenga (PI), Garry Harris (Co-PI), Matt Cox (Co-PI), Yang Liu (Co-I), Melanie Pearson (Co-I),

In Atlanta, Georgia, many communities face serious environmental justice issues, such as higher levels of exposure to extreme heat, air pollution, and a lack of green space. The overarching objective of this project is to enhance an existing GIS-enabled web-based mapping tool by integrating NASA Earth observations, geospatial, and socioeconomic data to more effectively address environmental justice concerns among Metro Atlanta communities. Local residents and stakeholders will play an active role in co-designing the tool to ensure it meets community-specific needs. The project's goal is to empower communities to better understand and mitigate environmental health risks by providing them with access to accurate and actionable environmental data.

A Community Workshop moderated by Co-PI Garry Harris

Building Co-Design and Co-Learning Digital Twins against Floods on Tribal Lands in support of Indigenous Communities

Team Members: Chengbin Deng (PI), Yang Hong (Co-I), Farina King (Co-I), Codie Topetchy (Co-I) , James LeClair (Co-I), Yixin Wen (Co-I)

Some of the previous visits to the Otoe-Missouria Tribe for community engagement (The faces of all participants are blurred to protect their privacy)

This proposal advances Indigenous environmental justice for Indigenous communities of tribal lands on flood risks within the territories of the Otoe-Missouria Tribe of Indians in Oklahoma. The team will engage the tribal community in co-designing, implementing, and sustaining the tools and a digital twin (DT) platform with EO data, focusing on preserving cultural heritage and building capacity for flood resilience. This new powerful too will allow the tribal community to understand and mitigate flood risks. Transferability and scalability of the platform and the communication method serves as a powerful framework for fostering collaborative relationships, building local capacity, and promoting environmental justice across indigenous communities.

Building Capacity for Resiliency, Education, and Environmental Justice across the Changing Indigenous Landscapes of Virginia

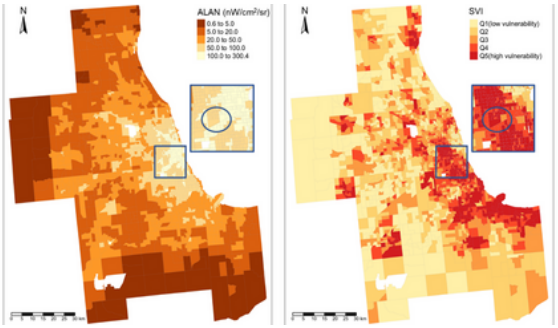
Team Members: David Salisbury (PI), Stephanie Spera (Co-I), Cameron Bruce (Co-I), Yunuen Reygadas Langarica (Co-I), Tammy Heath (Co-I), John Pierce (Co-I)

Although each Native American Nation has its own unique history and needs, conversations with Indigenous collaborators among the Nansemond, Mattaponi, and Monacan have highlighted the importance of food security, territorial control, energy independence, and thus climate resiliency. The University of Richmond's Local Indigenous Landscapes Team (LILT) will collaboratively co-design, with the Native American Nations of Virginia, a climate impacts geo-dashboard with the Earth science information they prioritize. This project will rely on NASA's remotely sensed data to inform decisions, actions, and policies that build Native American capacity for resiliency, awareness, and environmental justice across the changing Indigenous landscapes of Virginia. The final goals of this project will be determined through a measured, participatory, and intentional assessment and consultation process with Native American partners.

Chief Keith Anderson of the Nansemond Indian Nation (left) and his son, Kalen Anderson (right) prepare to meet visiting Amazonian Indigenous partners at the University of Richmond on September 13, 2024

CIELO: Chicago's Initiative for Environmental Justice and Light Pollution Outreach

Team Members: Qian Xiao (PI), Cici Bauer (Co-I), Luis Carranza (Co-I), Yuridia Gutierrez (Co-I), Waleska do Valle Santos (Co-I), Ken Walczak (Co-I), Kelly Borden (Co-I/Institutional PI), Zhuosen Wang (Consultant)



Environmental injustice in light pollution in the greater Chicago. Patterns of light pollution (left, lighter colors indicating higher levels) and Social Vulnerability (right, darker colors indicating higher levels) largely mirror each other: places with higher social vulnerability also have higher levels of light pollution. The circled area on the inset map shows the Little Village neighborhood and surrounding area, which is the project's area of focus.

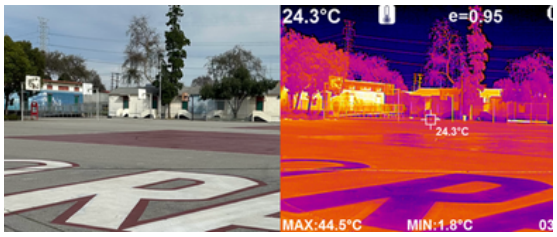
Light pollution is an emerging public health hazard that has been linked to elevated risk of many diseases. It has been shown that marginalized communities have a disproportionately high burden of artificial light at night (ALAN), and are more susceptible to develop adverse health effects related to ALAN. Team members of this project have partnered with Enlace Chicago, a local community organization, and high schools to develop and implement the Chicago's Initiative for Environmental Justice and Light Pollution Outreach (CIELO) program to achieve the following:

- Develop a GIS-enabled dashboard for the greater Chicago area that integrates multiple data sources with interactive tools for easy visualization and analysis.
- Expand and improve existing education programs and design new curriculum for local high school students to learn about light pollution.

Empowering Communities to Effect Change: Triangulating NASA Data and Participatory GIS with Photovoice and Human-Centered Design to Advance Community Action for Equity and Environmental Justice in Los Angeles

Team Members: Jason Douglas (PI), Jose Bustillo (Co-I), Janeth Preciado Vargas (Co-I), Milton Nimatuj (Co-I), Rossmery Zayas (Co-I), Ambar Rivera (Co-I/Institutional PI), Reginald Archer (Co-I/Insitutional PI), Richard Damoah (Co-I/Institutional PI), Scott Davidoff (Co-I/Institutional PI), Joshua Fisher (Co-I/Institutional PI)

In partnership with Communities for a Better Environment, a community-based organization leading the advancement of community action for equity and environmental justice in underserved communities, this team will examine the public health impacts of urban heat island-, air pollution-, and greenspace-related inequities in the Southeast Los Angeles (SELA) community of Southern California. The CBPR team will produce a lay-accessible, GIS-enabled dashboard that houses the data and information necessary to advance community action for environmental justice through community-academic partnerships, coordinated advocacy efforts, and policy change.



A traditional photo next to a thermal photo, the team captured surface temperatures as high as 45° C during a 21°C air temperature winter day in February 2024 at South Gate High School in SELA.

Fishpond stewardship through community partnerships and remote sensing

Team Members: Africa Flores-Anderson (PI), Kevin Chang (Co-I), Brenda Asuncion (Co-I), Christine Lee (Co-I/Institutional PI), Kelly Luis (Co-I/Science PI)

Fishponds, or loko i'a are traditional Hawaiian aquaculture systems. They were once vital for food security, but now indigenous communities in Hawai'i rely mainly on imported food. This team is partnering with a community-based organization to enhance fishpond communities' capacities to support fishpond restoration and stewardship by improved monitoring and assessment of water quality in critically endangered fishponds using Earth observations and community knowledge. This project will:

1. Assess, refine, and define community needs around fishpond management
2. Co-develop Earth observation products suitable for fishpond management, along with tools that combine community requirements and co-developed products for their access b) Establish GIS-enabled/compatible pipeline for routine access and use of decision support products
3. Carry out trainings on the applications of Earth observation for water quality monitoring.

Keawanui fishpond (left image) on the southeast side on the island of Moloka'i [Image credit to Mickey Pauole] Sentinel 2 A/B monthly composites of normalized difference chlorophyll index of Keawanui [Image credit to DEVELOP Spring 2024 team]

Building a scalable prison environmental justice tool with and for communities to educate and inform actionable decisions

Team Members: Carrie Chennault (PI), Caitlin Mothes (Co-I), Jordan Mazurek (Co-I), Danielle Wood (Co-I/Institutional PI), Ufuoma Ovienmhada (Graduate/Undergraduate Student)

In recent years, there has been a documented a pattern of environmental abuses at prisons, including air pollution, poor water quality, extreme temperatures, flooding, wildfires and more. The health effects of these hazards are acutely felt in prisons compared to the general population at large. Community organizers have identified a need for new mapping tools responsive to localized advocacy needs. Building on prior development of satellite-derived NASA Earth observation datasets and a GIS-enabled tool for prison EJ, this team will advance the technical analysis and societal impact of this work through community-engaged tool development.

Preliminary GIS tool featuring EJ datasets, which will serve as a starting point for community-engaged tool development for this project.

Project GREEN: Greenspace and Remote Sensing for the Environment and Equity in Neighborhoods

Team Members: Nicholas Kruskamp (PI), Kibri Everett (Co-I), Razaan Abnowf (Collaborator), Chris Coxen (Collaborator), Jonathan Holt (Collaborator), Christopher Johns (Collaborator), Meaghan McGrath (Collaborator), Ian Thomas (Collaborator)

The proposed project aims to investigate the impacts of land cover and land use change, specifically greenspace and urbanization, on health and equity in underserved communities in the Charlotte, North Carolina metropolitan area. The growing urban population is intensifying environmental challenges and deepening existing inequalities, particularly in the distribution of tree canopy and greenspaces. This project will take a user-centered design approach to co-develop a tool with community partners to provide them greater understanding of the impact of greenspace interventions. It leverages open remote sensing, socio-economic, demographic, and environmental equity data, from NASA and other sources, to gain deeper insight into the equity of greenspaces in their neighborhoods.

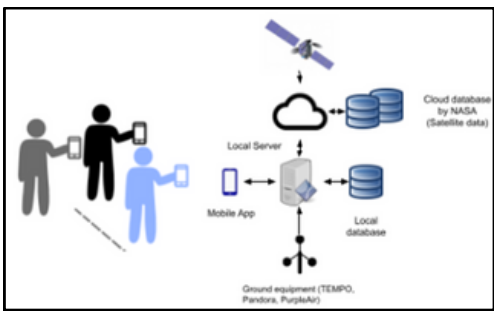
Democratizing remote sensing and environmental equity data by working with community partners to develop a flexible framework and tool for understanding urban heat islands and greenspace through a user-centered design approach.

Woniya Wichoni (Breath of Life) - An Air Quality Project that Centers Community, Land, and Climate Justice

Team Members: Nhut Ho (PI), Alayna Eagle Shield (Co-I), Alex Modarresi (Co-I), Tasha Peltier (Co-I), Mafany Ndiva Mongoh (Collaborator), Joe Roberts (Collaborator)

This project proposes Woniya Wichoni (Breath of Life), a suite of tools that local community members will use to collect air quality data, leverage the GIS information made available by NASA and other entities, and provide educational outreach and health provisions to community members. The intended impacts of this project are:

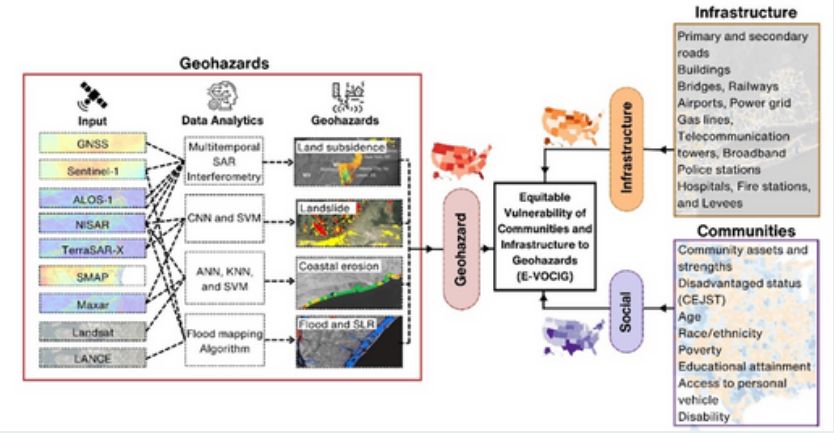
- Enactment of the sovereignty of Indigenous peoples to manage the collection and sharing of climate data across their land.
- Expand current local, regional, and national databases.
- Enrich current research efforts and solutions for environmentally induced illness and climate change
- Develop a model that will be scalable and generalizable to other communities nationwide.



Conceptual architecture of the system for this project

Integrating Earth Observations Toward Advancing Equitable Resilience to Geohazards in a Changing Climate

Team Members: Farshid Vahedifard (PI), Laurie Baise (Co-I), Elaine Donnelly (Co-I), Philip Giffee (Co-I), Manoochehr Shirzaei (Co-I), Paul Kirshen (Consultant), Beckie Finn (Co-I/Community Partner)



Proposed methodology for developing the Equitable Vulnerability of Communities and Infrastructure to Geohazards Index (E-VOCIG)

The goal of this project is to develop a near real-time geospatial framework capable of modeling and mapping the spatiotemporal evolution of geohazards (e.g., landslides, land subsidence, coastal erosion) while identifying priority regions within historically underserved and socially vulnerable communities. This project is co-designed and will be piloted in close collaboration with community partners in two communities: East Boston, MA and the Wampanoag Tribe of Gay Head (Aquinnah), MA. The project is structured around these work packages, ensuring a comprehensive approach that develops and implements tools, evaluates their effectiveness, and invests in community capacity building.

>>> NASA'S EQUITY AND ENVIRONMENAL JUSTICE PROGRAM <<<

NASA's EEJ Program aims to advance progress on equity and environmental justice. One part of this effort is to help build the community of practice around the application of Earth science information to inform action in EJ communities by monitoring and measuring environmental factors. This newsletter is one of the program's strategic communication efforts for engaging those working in the space. It will continue to evolve, so please share your thoughts for what information is useful to you!

Learn more about the EEJ Program and access our previous newsletters by visiting our website HERE.

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