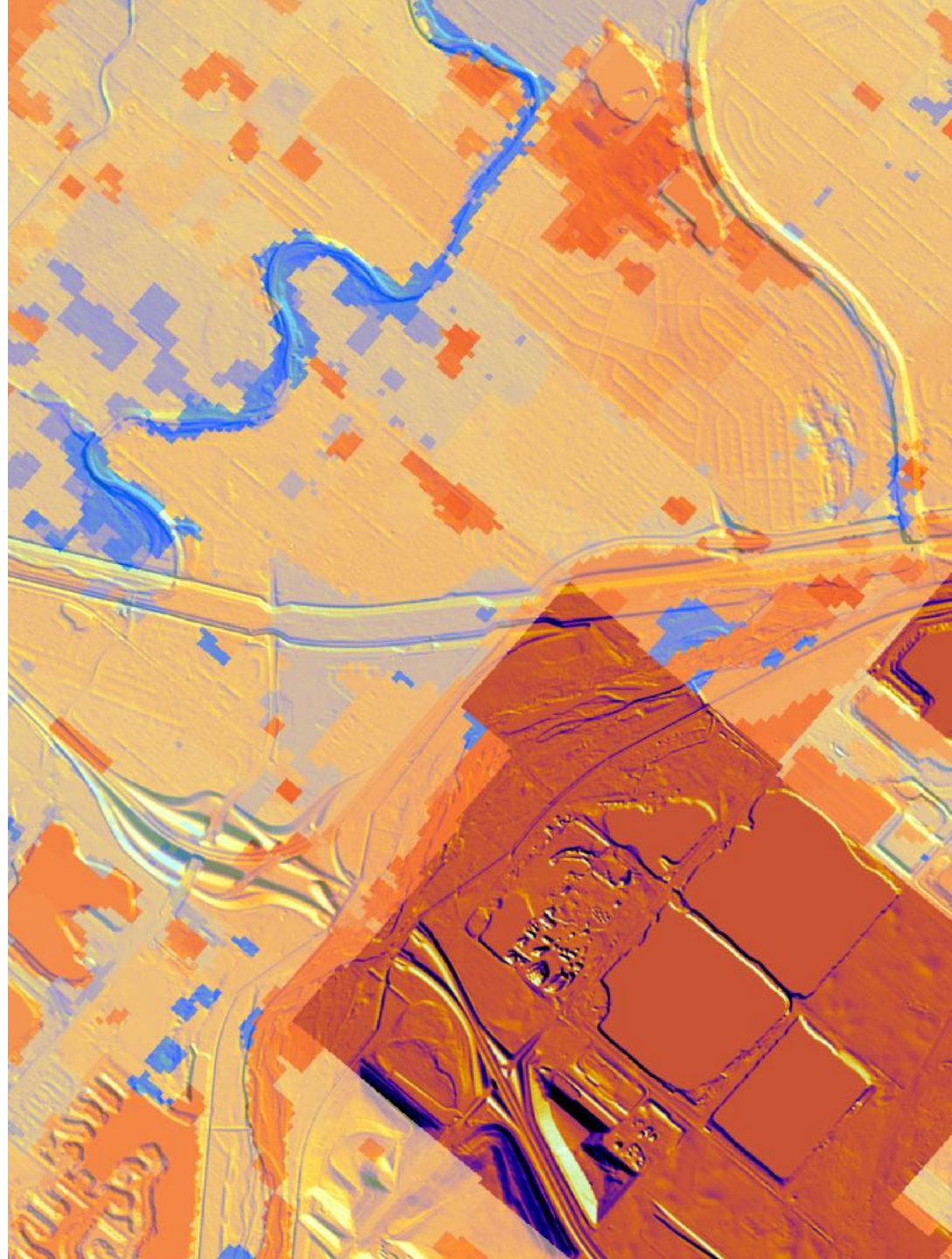


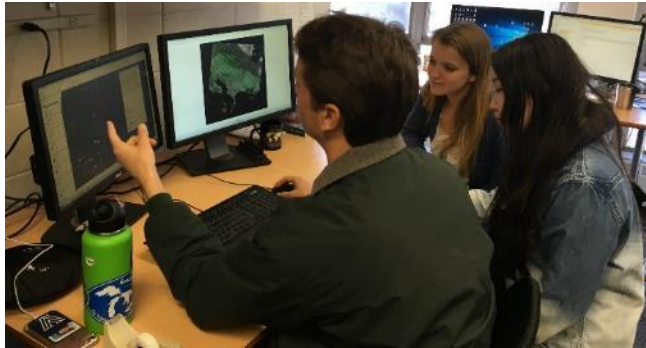


Highlights from NASA
Capacity Building:
DEVELOP



ABOUT DEVELOP

Empowered Participants + Earth Observations + Engaged Decision Makers



“Shaping the future by integrating Earth observations into global decision making”

DEVELOP bridges the gap between **NASA Earth Science and society**, building capacity in both its participants and end-user organizations to better prepare them to use remote sensing to address environmental challenges that face society.

Part of NASA’s Applied Sciences’ Capacity Building Program, DEVELOP addresses these challenges by conducting interdisciplinary feasibility projects that apply the lens of NASA Earth observations to community concerns around the globe.

ABOUT PROJECTS

Project Characteristics

50+ projects take place each year – at their core they share these characteristics:

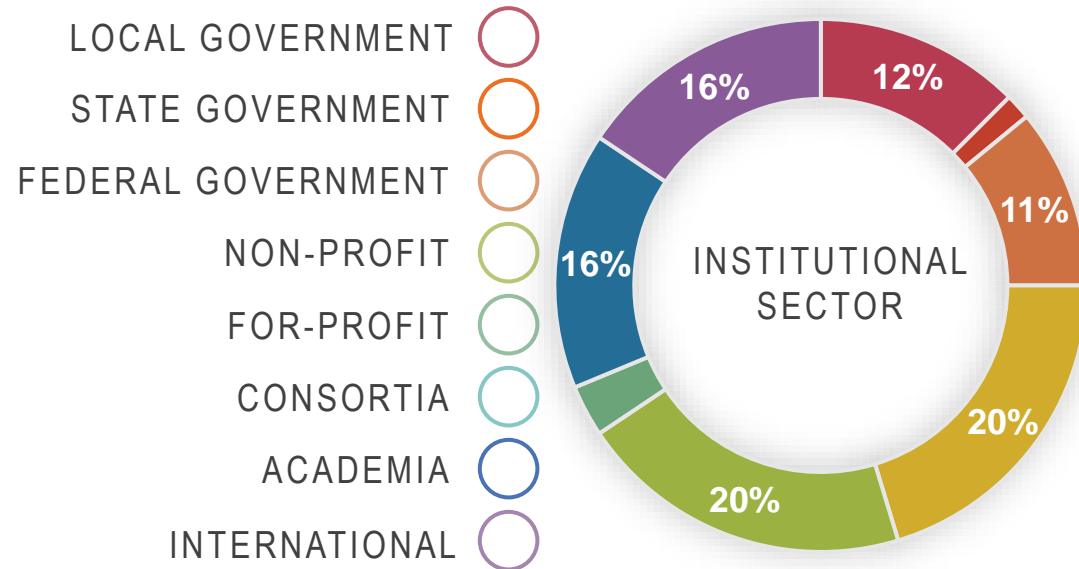
- Highlight the applications and capabilities of NASA Earth observations
- Address community concerns relating to decision-making for real-world environmental issues
- Partner with organizations who can benefit from using NASA Earth observations to enhance decision making by providing decision support tools
- Conducted in 10-week terms (spring, summer, and fall) by small teams with diverse backgrounds
- Align with at least one of the ten NASA Applied Sciences Program's National Application Areas
- Create a consistent set of deliverables
- Research is conducted under the guidance of Science Advisors and mentors from NASA and partner organizations



ABOUT PARTNERS

Project Partners

Any organization can partner with DEVELOP – state & local governments, federal agencies, tribal governments, non-profits, for-profits, international organizations, academia, etc.



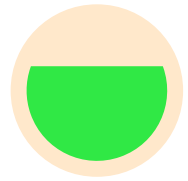
2022 Summer Term Partner Sectors

Project Development Process



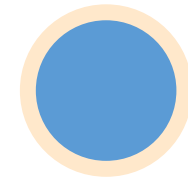
Idea Generation & Partner Engagement

- Initial engagement w/potential partner – listen to their interests, priorities, needs, and understand their decision-making process.
- Generate project idea – identify: study area, thematic focus area, actionable decision, potential end-products



Proposal Writing & Approvals

- Initial ideas reviewed by DEVELOP National Program Office.
- If approved, Fellows draft a proposal – including the partner in review and iteration.
- Proposals reviewed and approved by HQ, those selected are scheduled for a specific term and listed in the DEVELOP application.



Project Execution & More Iteration

- Communication lines are reopened with partners following approvals.
- Partners regularly meet with DEVELOP team during the term to discuss progress and results.
- Project results and methods are handed off at the end of the term.

HEALTH & AIR QUALITY THEMES

Air Quality

- ▶ Evaluating Atmospheric Mixing Height Estimations in the Western United States
- ▶ Mapping Air Quality Using NASA Earth Observations to Investigate Recent Increases in Ozone Concentrations
- ▶ Identifying Potential Methane Sources for Improved Monitoring of Offshore Oil & Gas Activity in the Gulf of Mexico

Urban Heat

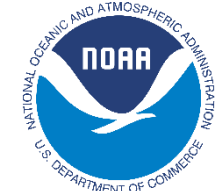
- ▶ Using Earth Observations and Socioeconomic Data to Assess Urban Heat-Induced Health Risk in Austin, Texas
- ▶ Identifying Environmental and Social Drivers of Urban Heat Vulnerability and Modeling Urban Cooling Interventions in Yonkers, New York

Disease Incidence

- ▶ Land Use Change in the Rapidly Developing Peruvian Amazon and Implications on Zoonotic Disease Incidence
- ▶ Using Remote Sensing to Detect the Frequency and Drivers of Red Tide Blooms in California to Assist in the Management of Human and Marine Exposure to Algal Toxins

Example Project Partners:

- ▶ California Department of Public Health
- ▶ California Office of Environmental Health and Hazard Assessment
- ▶ Oklahoma Department of Environmental Quality, Air Quality Division
- ▶ Groundwork USA
- ▶ Lake Michigan Air Directors Consortium

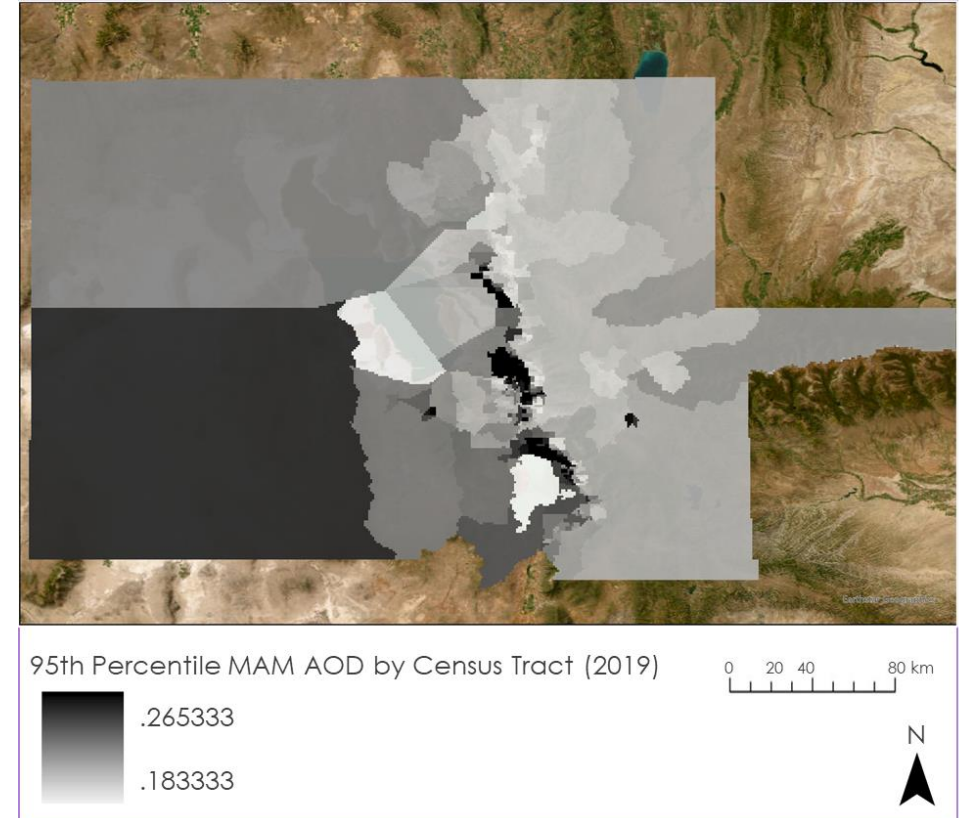


Monitoring Lakebed Exposure and its Impact on Air Quality and Environmental Hazards in the Great Salt Lake Watershed

Synopsis: Water flow into the Great Salt Lake has declined rapidly over the past forty years due to human withdrawals and climate change, and with over 50% of the lakebed now exposed, airborne toxic dust threatens to exacerbate already dangerous air quality conditions for the entirety of northern Utah, especially for communities of color and low socioeconomic status living in closest proximity in West Salt Lake City. By leveraging data from **Terra/Aqua MODIS, Suomi NPP VIIRS, Sentinel-5P TROPOMI, CALIPSO CALIOP, and Landsat**, the DEVELOP team created air quality vulnerability maps to inform the Utah Departments of Natural Resources and Environmental Quality's dust mitigation and management strategies.

Partners:

- Utah Dept. of Natural Resources
- Utah Dept. Of Environmental Quality
- Great Salt Lake Institute
- Dust^2
- Great Salt Lake Coalition
- Utah Physicians for Healthy Environment
- Northwest Band of the Shoshone Nation
- Westside Coalition

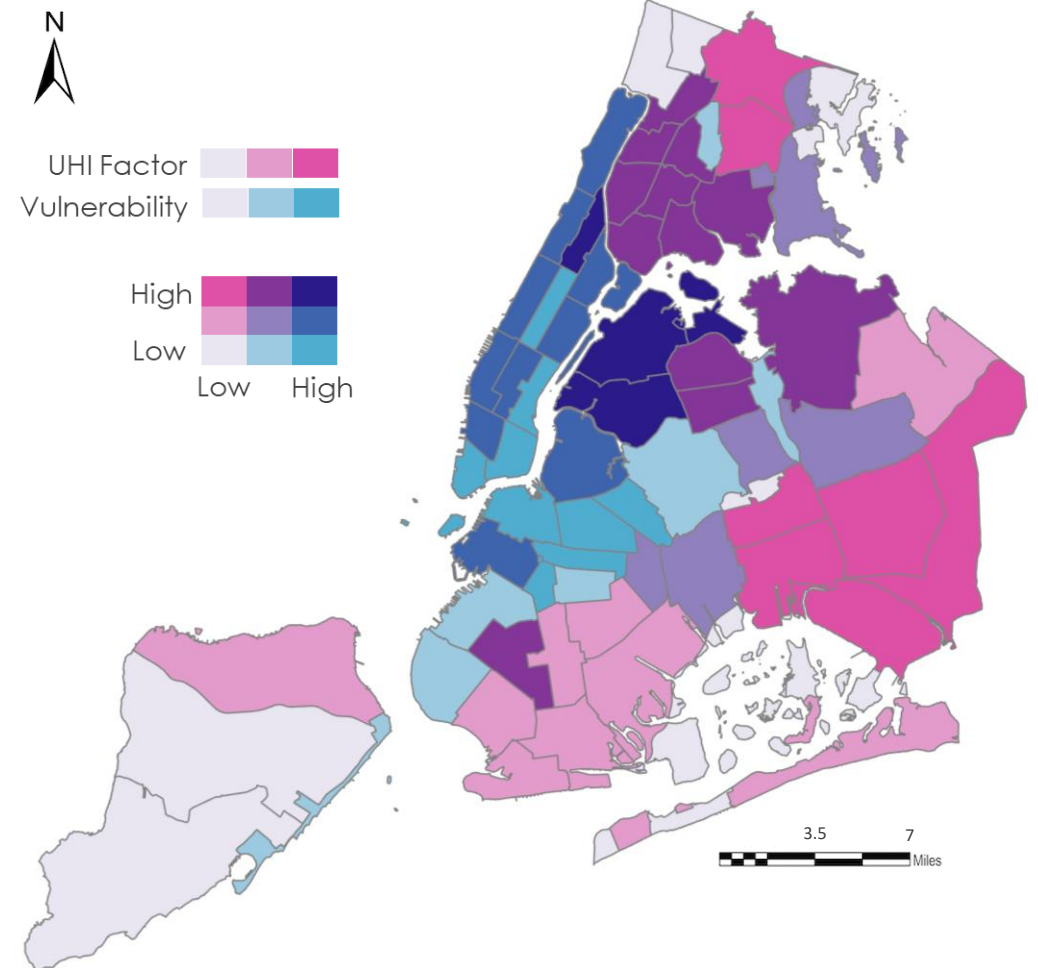


Assessing Urban Heat Island Effects at Bus Stops in New York City to Support Cooling Interventions

Synopsis: Urban heat in New York City, NY is exacerbated by the city's built environment, leading to the urban heat island effect. Oppressive public policies have perpetuated inequities in shade distribution and heat exposure along lines of race and class, having serious implications on extreme heat exposure while taking the bus. Utilizing **Landsat 8 TIRS** and **Landsat 9 TIRS-2** data we mapped the Urban Heat Island Effect and created a Transportation and Heat Vulnerability Index using social, transportation, and environmental data for New York City. This analysis supports our partner Transportation Alternative's efforts to increase transportation accessibility within the city.

Partner:

- Transportation Alternatives



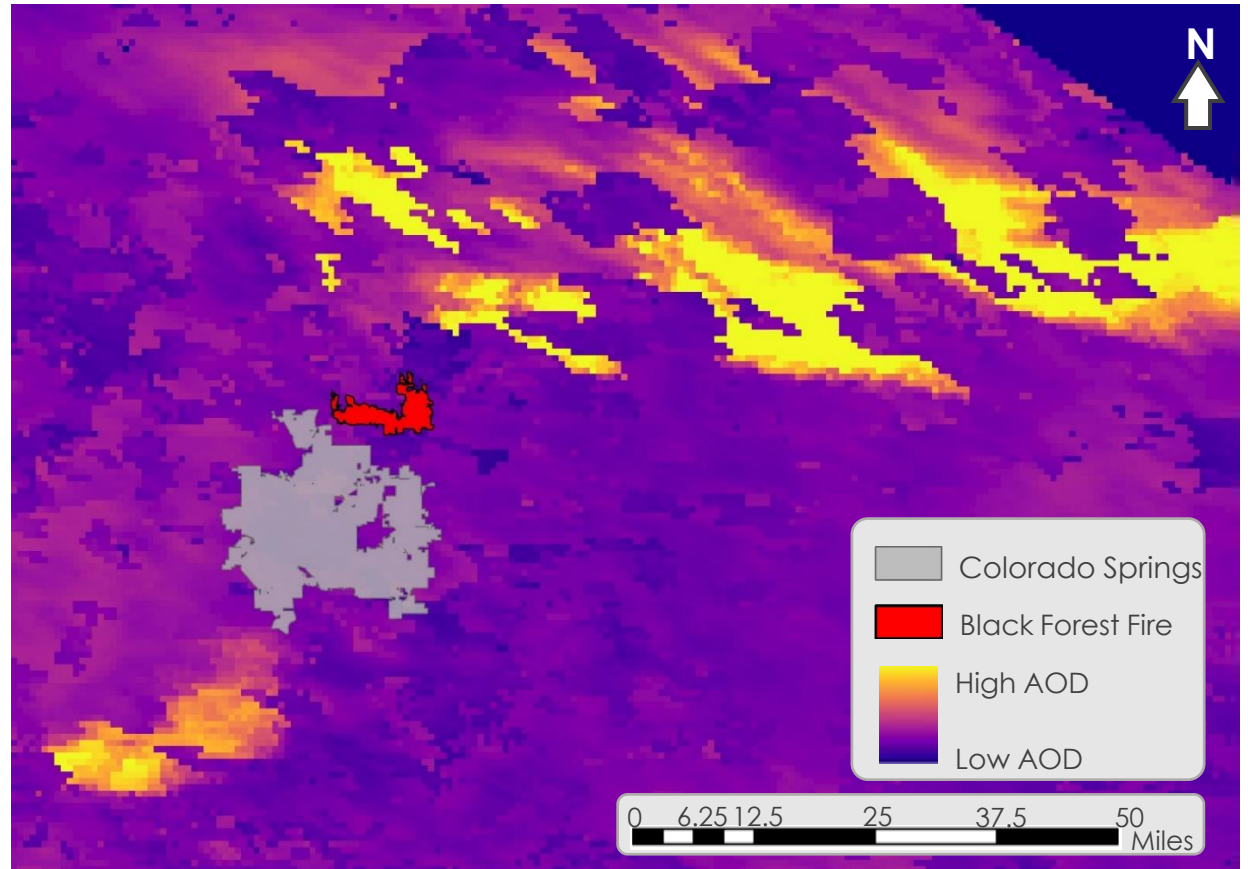
Using Earth Observations to Monitor Wildfire Smoke and Air Pollution for Enhanced Air Quality Management in Colorado Springs, Colorado

Synopsis: The growing City of Colorado Springs is known for its majestic beauty yet has experienced poor air quality conditions, exacerbated by wildfires. The City is interested in the application of Earth observations to support enhanced air quality monitoring and disaster resilience, improve its regulations and management practices, and ensure its compliance with the Clean Air Act. This project will explore the utilization of data from a suite of instruments (**MODIS**, **CALIOP**, and **TROPOMI**) to measure air quality trends in aerosol optical depth (AOD) and nitrogen dioxide (NO₂), examine air pollutants distribution, and explore the impact of fire events on the city and region's air quality. The project created replicable methodologies for monitoring air quality by satellite and explored their integration using *in situ* measurements.

Partner:

- City of Colorado Springs

Black Forest Fire (2013)



How to get involved!



Visit the DEVELOP website:

<https://appliedsciences.nasa.gov/nasadevelop>

Email us at:

NASA-DL-DEVELOP@MAIL.NASA.GOV



Tweet **@NASA_DEVELOP** or
#NASADEVELOP

http://twitter.com/#!/nasa_develop



DEVELOP National Program:

www.facebook.com/developnationalprogram

Project Planning Timeline:

Spring 2024

- ▶ **Idea submission:** April 2023
- ▶ **Term:** January 22nd – March 29th

Summer 2024

- ▶ **Idea submission:** August 2023
- ▶ **Term:** June 7th – August 9th

