DEVELOP Preview

Spring 2025

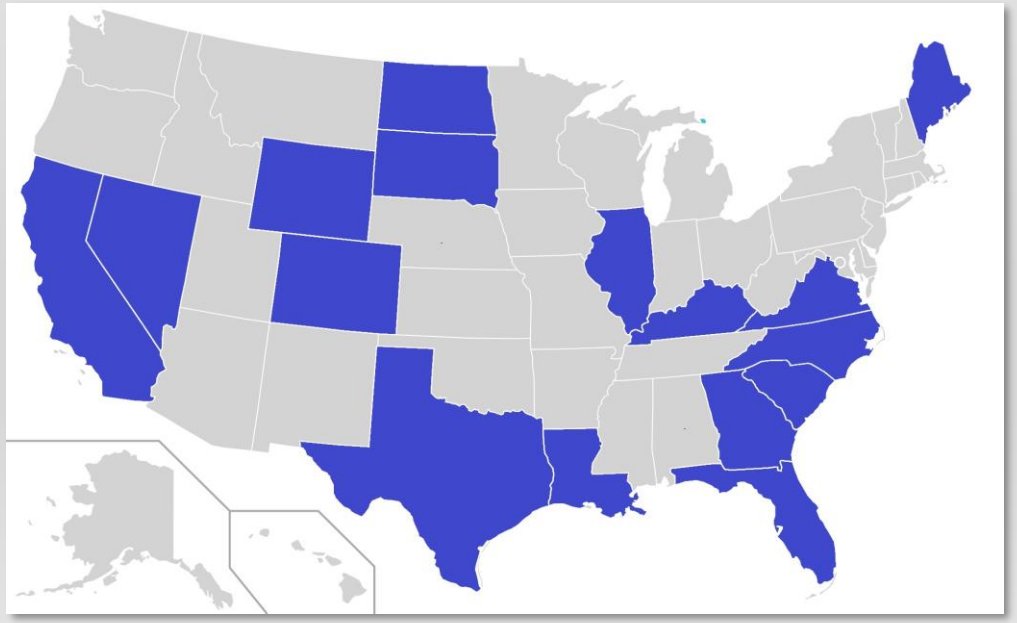
EARTH ACTION

EARTH ACTION

113 Participants	55+ Partners	28 Projects

16

States

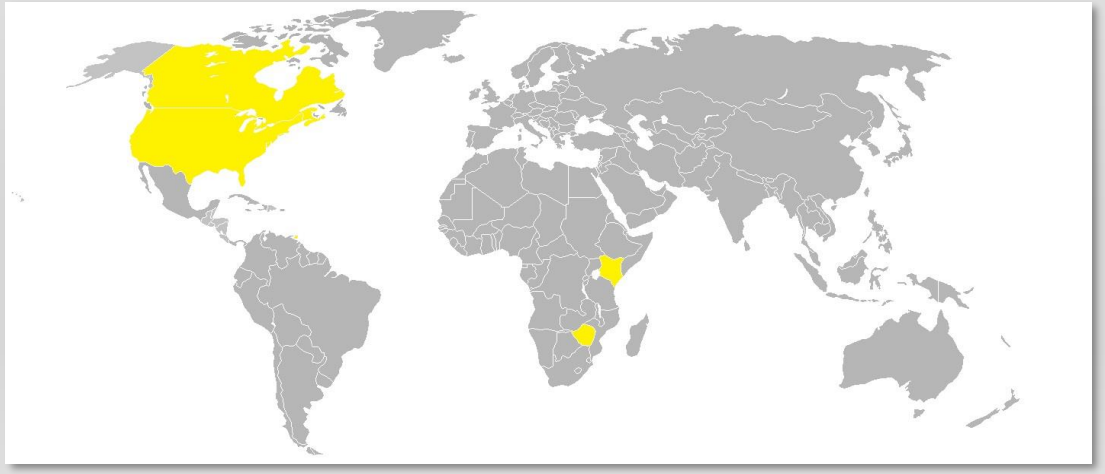


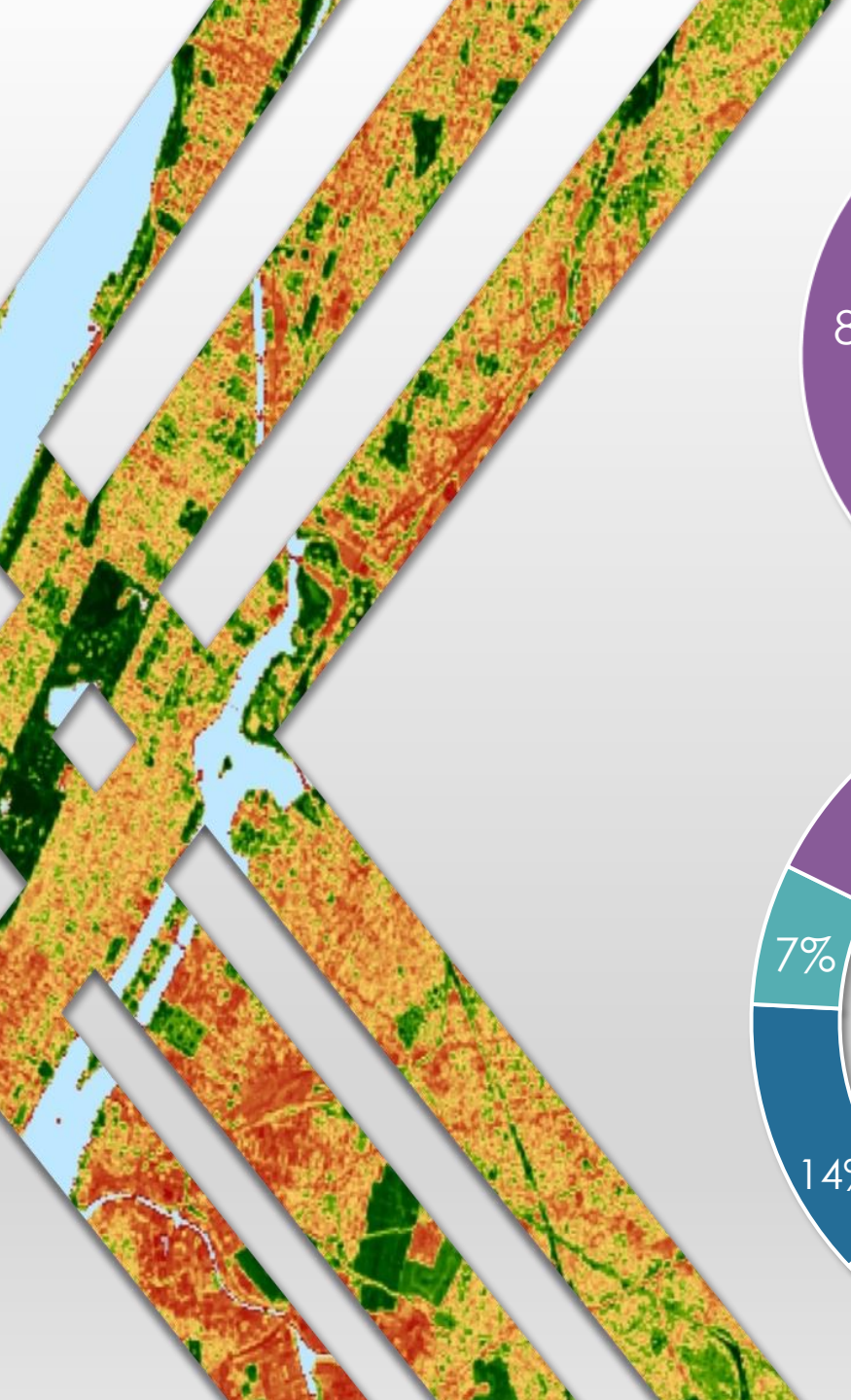
EARTH ACTION

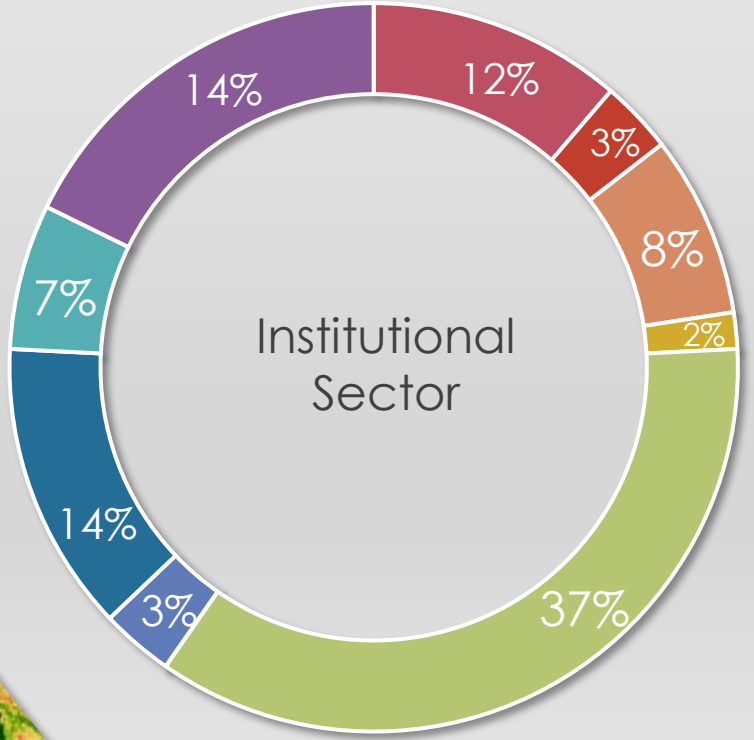
113 Participants	55+ Partners	28 Projects

5

Countries







- Agriculture
- Water Resources
- Ecological Conservation
- Health and Air Quality
- Disasters
- Climate
- Wildland Fires

- Academic
- Consortium
- Local Government
- State Government
- Federal Government
- Intergovernmental
- For Profit
- Non-Profit
- Tribal
- International

NASA EARTH ACTION

Texas & Georgia Agriculture

Community Concern: In recent years, cotton quality and yield has declined across the southern United States. This threatens a large part of the agricultural industry and could negatively impact local and state economies.

Partners:

- USDA, Agricultural Research Service, Hydrology and Remote Sensing Laboratory
- USDA, Agricultural Marketing Service, Market News Division

Earth Observations:

- ISS ECOSTRESS
- Harmonized Landsat 8/Sentinel-2
- GPM IMERG
- SMAP L-band Radiometer

Impact: Trends in cotton production and climate drivers will be compared to inform partners' climate-adaptive decision-making and resource allocation to mitigate poor quality bales and support a sustainable cotton industry.

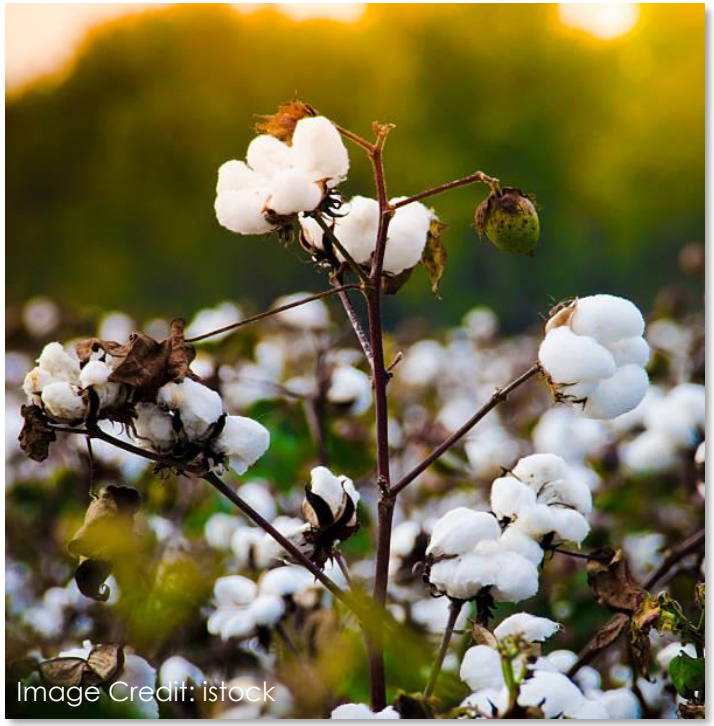


Image Credit: istock

Maryland – Goddard

EARTH ACTION

Western US Water Resources

Community Concern: Freshwater springs in the western US are critical for wildlife, water resources, rare plants, and general biodiversity.

Partners:
- The Two Frontiers Project
- National Park Service, Mojave National Preserve & Castle Mountains National Monument
- Bureau of Land Management, Winnemucca District Office
- USGS, Colorado Water Science Center

Earth Observations:
- Landsat 7 ETM+
- Landsat 8 OLI
- Landsat 8 TIRS
- Landsat 9 OLI-2
- Landsat 9 TIRS-2
- Sentinel-2 MSI
- Planetscope


Image Credit: The Two Frontiers Project

Impact: Partners will use detection models and maps to manage and help conserve pristine spring areas within national monuments and preserves.

Colorado – Fort Collins

NASA EARTH ACTION

Coastal Southern Carolina Water Resources

Community Concern: In response to the 2023 US Supreme Court case Sackett vs. EPA, which ruled that federal protection under the Clean Water Act only applied to wetlands directly connected to rivers, lakes, and other navigable waters, this project aims to map isolated freshwater wetlands in coastal South Carolina.

Image Credit: iStock

Earth Observations:

- Landsat 7 ETM+
- Landsat 8 OLI
- Worldview-2
- Sentinel-1 C-SAR

Partner:

- Coastal Conservation League

Impact: This project will assist the Coastal Conservation Group in advocating for wetland protection and supporting impacted coastal communities.

Georgia – Athens

NASA EARTH ACTION

Great Slave Lake Water Resources

Community Concern: Local Indigenous communities and government agencies have noticed decreases in Great Slave Lake's water quality. This has negatively impacted local ecology, including important fishing resources, affecting the ecosystem and communities that depend on the lake's resources.

Partners:

- Government of the Northwest Territories, Water Research and Monitoring Section
- K'atl'odeeche First Nation, Land and Resources Division
- Aboriginal Aquatic Resource & Oceans Management, Akaitcho Territory Government
- Deninu K'ue First Nation, Aquatics Division


Image credit: Wikimedia Commons

Earth Observations:

- Sentinel-2 MSI
- Sentinel-3 OLCI
- Landsat 8 OLI
- Landsat 9 OLI-2
- Aqua MODIS
- PACE OLI

Impact: This project will help inform the partner's future monitoring practices, particularly near Indigenous communities and areas connected to major rivers. Gaining a more comprehensive understanding of long-term changes in water quality will help the partners advise future management and policy initiatives that impact nearby ecosystems and communities.

Massachusetts – Boston

NASA EARTH ACTION

Fajardo River Water Resources

Community Concern: In eastern Puerto Rico, the Fajardo River watershed drains towards coral reefs and popular recreational sites. It is also a key component of PR's water infrastructure as it supplies the Northeast regional aqueduct. PRASA manages water service on the island and is interested in evaluating the effects of water utility infrastructure on the environment.

Partners:

- Puerto Rico Aqueduct and Sewer Authority Environmental Mapping Consultants
- Sociedad Ambiente Marino

Earth Observations:

- Landsat 5 TM
- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI
- Sentinel-3 OLCI
- Suomi NPP VIIRS
- Envisat MERIS

Impact: The NASA DEVELOP team will map historic land cover land use change (LCLUC) and coastal water quality. The team will evaluate if there is a relationship between LCLUC and coastal water quality through a decadal analysis to help the partners protect PR's water quality and set water management priorities.

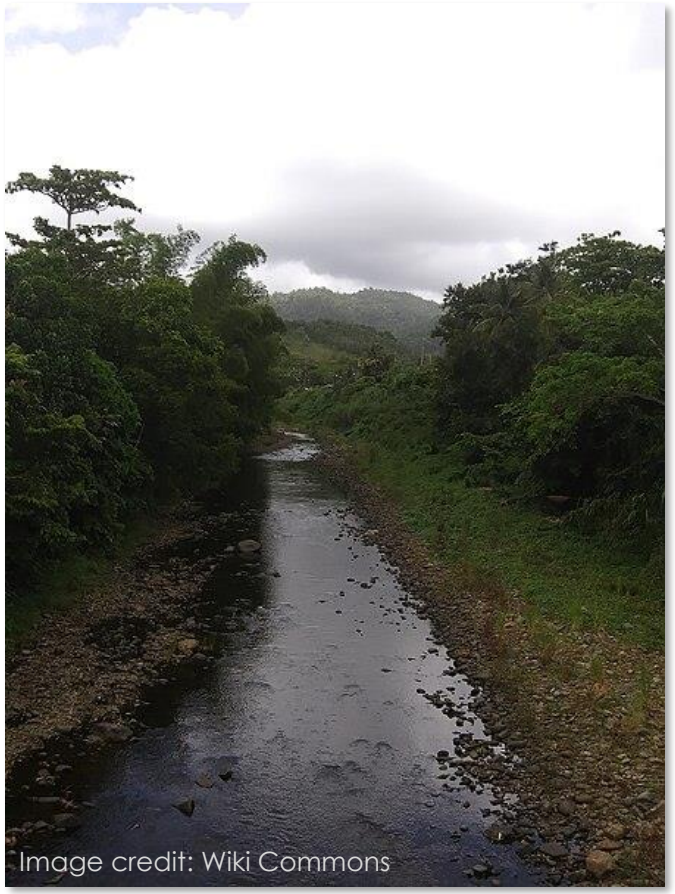


Image credit: Wiki Commons

California – Ames

EARTH ACTION

Upper Missouri River Basin Water Resources

Community Concern: The Upper Missouri River Basin in North Dakota is experiencing an increase in periods of drought and flooding. The region is challenged with accurately monitoring and contextualizing soil moisture variability in relation to drought and flooding to improve management and forecasting.

Partners:

- NOAA, National Weather Service Weather Forecast Office, Grand Forks
- NOAA, National Weather Service Weather Forecast Office, Bismarck
- North Dakota State University

Earth Observations:

- SMAP

Image Credit: National Archives Catalog

Impact: This collaboration aims to calculate fractional available water over North Dakota and compare to existing mesonet datasets. It will support flood and drought monitoring in the region to address community climate preparedness and inform agricultural resilience.

North Carolina – NCEI

EARTH ACTION

Coastal Florida Ecological Conservation

Community Concern: Tarpon, a major game fish found in Florida waters, specifically in seagrass and mangroves, are threatened by unregulated recreational fishing practices and damaged habitats.

Image Credit: jtu

Partners:

- Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute
- Bonefish and Tarpon Trust

Earth Observations:

- Landsat 5 TM
- Landsat 8 OLI
- Landsat 9 OLI-2
- Aqua MODIS
- Terra MODIS
- PlanetScope

Impact: The team will create mangrove and seagrass extent maps, as weli as water quality maps, to help the partners track the health of tarpon habitats and could help them assess conservation and restoration efforts of estuaries.

California – Ames

NASA EARTH ACTION

Flat Tops Ecological Conservation

Community Concern: Invasive yellow toadflax threatens native plant communities around the Flat Tops Wilderness Area of Northwest Colorado. However, the distribution and extent of this species in remote and difficult access alpine meadows is largely unknown.

Partner:

- USDA, US Forest Service, Medicine Bow-Routt National Forests, Yampa Ranger District

Earth Observations:

- Landsat 5 TM
- Landsat 8 OLI
- Sentinel-2 MSI
- SRTM
- Landsat 7 ETM+
- Landsat 9 OLI-2

Impact: Current extent maps of Yellow Toadflax will help the Forest Service identify areas for invasive species removal efforts.

Image credit: Truman Anarella

Colorado – Fort Collins

NASA EARTH ACTION

Garissa County Ecological Conservation

Community Concern: The Hirola are a critically endangered species of antelope, and invasive woody shrubs are encroaching upon their habitat within Kenyan savannahs.

Impact: Historical trends of invasive shrub encroachment will help quantify the changes over time and guide management and restoration actions. Current extent maps will inform partners about target areas for hirola habitat conservation.

Image credit: Hirola Conservation Program

Partner:

- Hirola Conservation Program

Earth Observations:

- Landsat 5 TM
- Landsat 7 ETM+
- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI
- SRTM

Colorado – Fort Collins

NASA EARTH ACTION

South Dakota Ecological Conservation

Community Concern: Juniperus virginiana, or eastern redcedar, is a woody invasive that has encroached grasslands in the Great Plains, reducing forage for livestock and wildlife, displaces upland game and grassland bird species, and increases the risk of detrimental wildfires. A native to the eastern United States, the species has expanded rapidly into southern South Dakota due to the removal of wildland grass fires from rangelands.

Earth Observations:

- Landsat 5 TM
- Landsat 7 ETM+
- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI
- PlanetScope

Partner:

- National Audubon Society, Audubon Great Plains

Impact: With the use of remote sensing, the end-products aim to better inform our partner of the climate-driven Eastern redcedar invasion. This will help in their implementation of improved invasion plant management strategies.

Image Credit: South Dakota State University

Georgia – Athens

NASA EARTH ACTION

Zimbabwe Ecological Conservation

Community Concerns:
Zambezi National Park is experiencing rapid urbanization, disrupting wildlife habitats and intensifying human-wildlife conflict.

Climate change-driven drought worsens these pressures on wildlife populations.

Elephants have shown aggression towards trees used by white-backed vultures for nesting, threatening the birds' survival and underscoring the need for stronger conservation strategies.

Earth Observations:
- Landsat 5 TM
- Landsat 7 ETM+
- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI
- PlanetScope SuperDove

Image Credit: iStock

Partners:
- Connected Conservation Trust
- Victoria Falls Wildlife Trust

Impact: Provide critical information to prioritize protection efforts for vulnerable tree species and their avian inhabitants.

Georgia – Athens

NASA EARTH ACTION

Southern Indiana Ecological Conservation II

Community Concern: Fire suppression in southern Indiana has led to an ecological shift: closed-canopy forests dominated by shade-tolerant, mesophytic species are encroaching upon native shade-intolerant, drought-tolerant, and fire-adapted plant communities.

Partners:

- Let Sunshine In-Indiana: Central Hardwood Joint Venture, American Bird Conservancy
- USDA, US Forest Service, Hoosier National Forest

Earth Observations:

- ISS GEDI
- Landsat 9 OLI-2
- Landsat 8 OLI
- Landsat 7 ETM+
- Landsat 5 TM
- Sentinel-2 MSI

Hoosier National Forest

Impact: The team will create maps of foliage height diversity to help partners identify areas undergoing mesophication and in need of restoration. Canopy cover change maps will provide partners with a valuable tool to communicate need for forest restoration efforts to the public.

Maryland – Goddard

EARTH ACTION

Northern Rockies Ecological Conservation II

Community Concern: Whitebark pine is a federally threatened keystone and foundational species located in high elevation regions of the intermountain west. Crucial for supporting biodiversity and providing vital ecological services, Whitebark pine has been on the decline due to the nonnative pathogen white pine blister rust, bark beetle infestations and fire activity.


Image Credit: Julee Shamhart

Partners:

- USDA US Forest Service, Region 1
- Whitebark Pine Ecosystem Foundation
- US Fish & Wildlife Service
- National Park Service
- Bureau of Land Management
- Yellowstone Club

Earth Observations:

- Landsat 8 OLI
- Landsat 9 OLI-2
- ISS ECOSTRESS
- Sentinel-2 MSI

Impact: Whitebark pine is predominantly found on US Forest Service land in rugged, rocky and difficult to access terrain. Remote sensing solutions for accurately determining the species occupancy will provide necessary management tools for assessing mortality and ecosystem health.

Idaho – Pocatello

NASA EARTH ACTION

Sonoran Desert Ecological Conservation

Community Concern: Parts of the Sonoran Desert are experiencing infestations of buffelgrass, a category 1 invasive species with rapid ecosystem conversion potential. The infestation's large scale and remote locations make it challenging to manage.

Partners:

- National Park Service, Saguaro National Park
- US Fish and Wildlife Service, Arizona National Wildlife Refuge
- USGS
- National Park Service, Tumacacori National Historical Park

Earth Observations:

- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI

Image Credit: National Park Service

Impact: The team will create a buffelgrass habitat suitability model and calculate the presence probability of current buffelgrass infestations for the study area. This will help partners design and evaluate the effectiveness of current and future management plans.

Idaho – Pocatello

NASA EARTH ACTION

Amargosa Ecological Conservation

Community Concern: Over the years, the Amargosa Basin has experienced shifts in water use patterns due to increased industry and development. The Timbisha Shoshone Tribe want to restore the mesquite bosque because it holds significant cultural value and is home to the western honey mesquite that provides sustenance for the tribe.

Partners:

- Friends of the Amargosa Basin
- U.S. Fish and Wildlife Service Southern Nevada Fish and Wildlife Office, Partners for Fish and Wildlife Program
- Timbisha Shoshone Tribe
- University of California, Davis
- National Park Service, Death Valley National Park

Earth Observations:

- Landsat 8 OLI
- Landsat 9 OLI-2
- Landsat 5 TM
- Sentinel-1 C-SAR
- Terra MODIS


Image credit: Amargosa Conservancy

Impact: The end users will use the vegetation health and land cover change maps to develop effective water conservation and native plant restoration policies. These management plans will help in the process of establishing the Amargosa Basin as a national monument.

California – JPL

NASA EARTH ACTION

Puerto Rico Ecological Conservation

Community Concern: Land-use change is altering the spatial distribution of frog and bird species in Puerto Rico, creating a mismatch between protected areas and suitable habitats.

Partners:
- WildMon
- US Fish and Wildlife Service, Caribbean Ecological Services Field Office
- Puerto Rico Department of Natural and Environmental Resources
- Para la Naturaleza
- University of Puerto Rico

Earth Observations:
- Landsat 5 TM
- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI


Image Credit: Wiki Commons

Impact: The team will create land cover change maps to highlight critical areas for safeguarding suitable habitats for frog and bird populations. These methods will help guide end users' decisions on land and habitat management for biodiversity conservation.

North Carolina – NCEI

EARTH ACTION

Gulf Coast Ecological Conservation

Community Concern: Wetlands in the Gulf Coast of the United States serve as vital habitats for migrating birds; however, their existence has been threatened in recent years due to variability in precipitation and temperature, drought, and human land use.


Image credit: Lukas Vermeer

Partners:

- USGS, Wetland and Aquatic Research Center
- Gulf Coast Joint Venture

Earth Observations:

- Sentinel-1 C-SAR
- Sentinel-2 MSI
- Landsat 8 OLI
- Landsat 9 OLI-2
- ALOS-2 PALSAR-2
- Capella SAR
- PlanetScope

Impact: The results from this project will help partners understand how Synthetic Aperture Radar and optical Earth observations may enhance wetland monitoring and inform private landowner's migratory bird conservation practices.

Pop-Up Project – Mississippi State University

NASA EARTH ACTION

Kentucky Disasters

Community Concern: In recent years, the increased frequency and extended season of tornadoes in the Midwestern U.S. has put more people at risk of losing power. Reliable and cost-effective data is necessary to delineate affected areas and estimate populations needing assistance during and after tornadoes and other types of disasters.

Partner:

- Kentucky Emergency Management

Earth Observations:

- Suomi-NPP VIIRS
- Landsat 8 OLI
- Landsat 9 OLI-2
- Sentinel-2 MSI


Image Credit: David Ewoldt

Impact: Power outage spatial extent, duration, and intensity detected by NASA Earth observations will aid in validating loss and tornado recovery assessments. This project will help inform future disaster response and support the recovery after major disasters.

Pop-Up Project – Miami University

EARTH ACTION

Davidson Health & Air Quality

Community Concern: The Town of Davidson's mission is to be a model city for climate resilience and sustainability. The Town wants to assess the impact of the highway's proximity to town, and to address future development as it impacts socially vulnerable populations.


Image Credit: Ken Lund

Partner:
- Town of Davidson

Earth Observations:
- Terra MODIS
- Terra Aqua
- Pace OCI
- TEMPO
- Terra MOPITT

Impact: Pollutant concentration maps and a pollution exposure and vulnerability map will enhance the Town of Davidson's understanding of NO_2, CO, and ground-based pollution concentrations, as well as helping to identify areas of vulnerable populations.

Virginia – Langley

EARTH ACTION

Boynton Beach Health & Air Quality

Community Concern: The City of Boynton Beach has approximately 16% tree canopy coverage. Citizens in areas with low canopy cover are more vulnerable to health issues related to excess heat.

Partner:
- City of Boynton Beach

Earth Observations:
- Landsat 8 OLI & TIRS
- Landsat 9 OLI-2 & TIRS-2
- ISS ECOSTRESS
- PlanetScope

Impact: Neighborhood canopy coverage maps and heat vulnerability index maps will allow the City of Boynton Beach to make informed decisions focused on targeting neighborhoods needing enhanced tree canopy coverage.

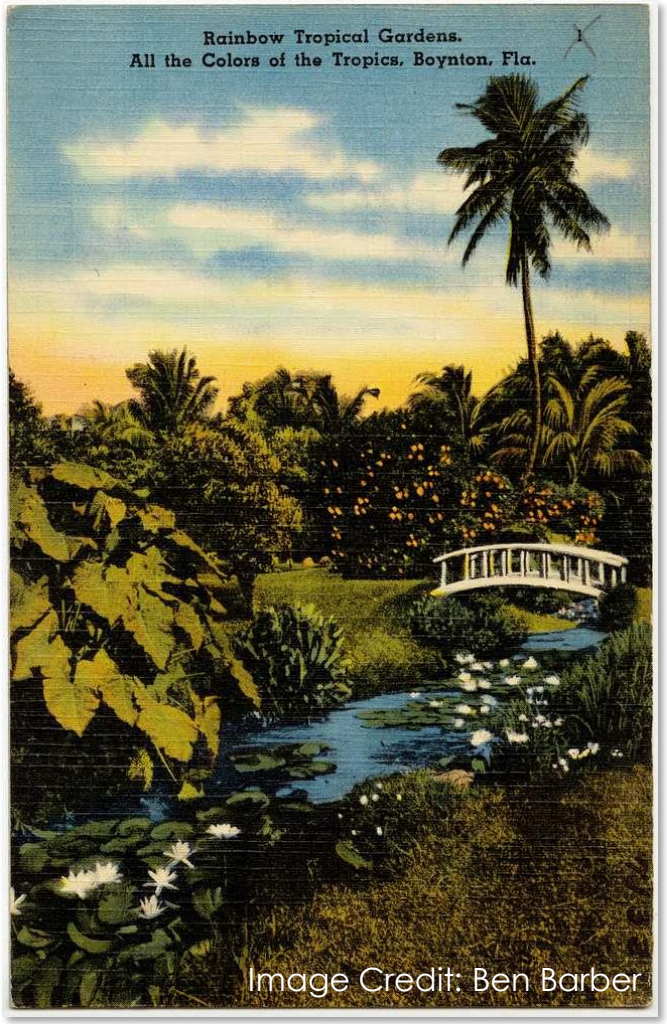


Image Credit: Ben Barber

Virginia – Langley

EARTH ACTION

Hampton Roads Health & Air Quality III

Community Concern: Gaseous pollutants from vehicle exhaust are causing health concerns near areas of traffic congestion, like the Hampton Roads Bridge Tunnel (HRBT). An expansion project at the HRBT is causing traffic pattern changes and more congestion around Hampton and Norfolk, Virginia.

Partner:

- Virginia Department of Environmental Quality

Earth Observations:

- TEMPO
- Sentinel-5 TROPOMI

Impact: The NO_2 concentration maps will help locate areas most in need of close air quality monitoring and allow the Virginia Department of Environmental Quality to assess the needs of air quality sensors in those areas. The pollution exposure and vulnerability map will highlight areas of negatively impacted populations located near the HRBT.

Image Credit: Ben Schumin

Virginia – Langley

NASA EARTH ACTION

Southeast Los Angeles Health & Air Quality

Community Concern: Communities alongside Interstate-710 are at risk of inhaling vehicle exhaust emissions at various hours of the day. This makes them susceptible to respiratory problems. Clean air projects led by the community are vital to mitigate these concerns

Partner:

- Communities for a Better Environment

Earth Observations:

- TEMPO
- Sentinel- 5P TROMPOMI
- PACE OCI

Impact: Results from this project will provide information on air pollutant distribution, hot spots, and most vulnerable areas to inform advocacy efforts for clean air projects.

Image Credit: Maxx Girr

Alabama – Marshall

NASA EARTH ACTION

Clarksville Health & Air Quality

Community Concern: Urban heat is a concern for expanding cities like Clarksville, TN given their increase of impervious surfaces and, in hand the risk of heat stress. Urban heat can have serious effects on human health and infrastructure, especially during hot summer months.

Partners:
- City of Clarksville
- Tennessee Urban Forestry Council

Earth Observations:
- Landsat 8 OLI
- Landsat 8 TIRS
- Landsat 9 OLI
- Landsat 9 TIRS
- ISS ECOSTRESS
- PlanetScope

Impact: Results from this project will visualize natural vegetation over time and provide a heat vulnerability index to inform areas in need future tree canopy planting and implementation.

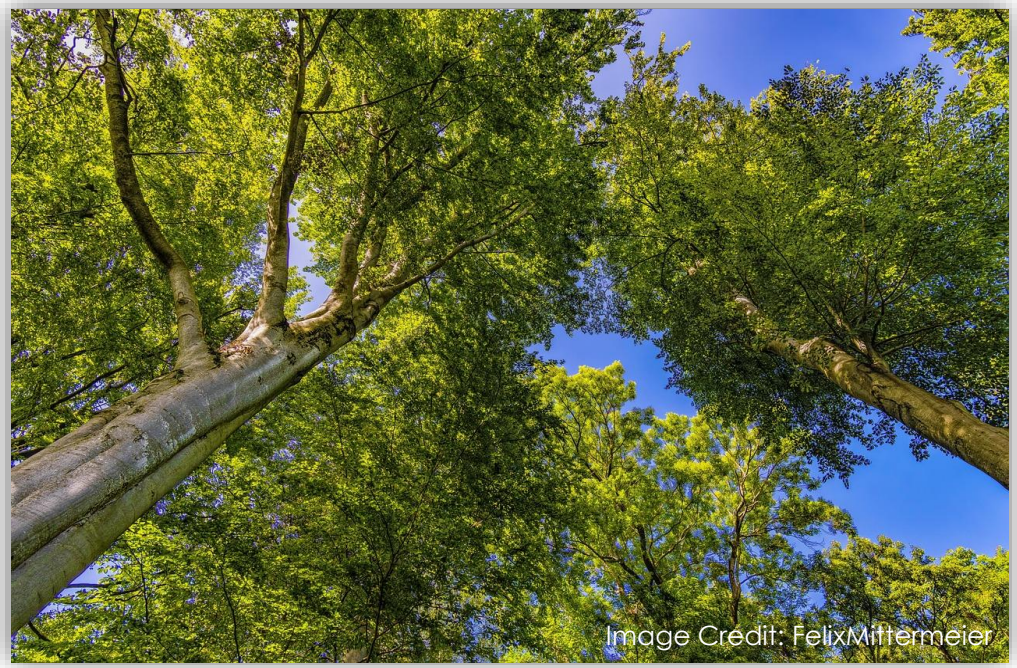


Image Credit: FelixMittermeier

Alabama – Marshall

EARTH ACTION

Harrisonburg Health & Air Quality

Community Concern: Harrisonburg has lost over 1,500 ash trees on public lands since the arrival of emerald ash borer in 2017. This is a concern because urban trees are widely accepted as one of the most effective long-term solutions to reducing the effects of urban heat islands.

Partner:
- City of Harrisonburg, Public Works

Earth Observations:
- Landsat 8 OLI/TIRS
- Landsat 9 OLI-2/TIRS-2
- Sentinel-2 MSI
- ISS ECOSTRESS
- ISS GEDI
- Dove PlanetScope

Image Credit: Michael Watkins

Impact: This project will identify tree canopy and land surface temperature change in Harrisonburg to identify potential areas for future tree planting initiatives.

Pop-up Location – James Madison University

EARTH ACTION

Portland Health & Air Quality

Community Concern: Located along the coast of the rapidly warming Gulf of Maine, Portland and South Portland, Maine, are subject to the impacts of the Urban Heat Island effect. With higher population densities, sparser tree cover, and greater amounts of heat absorbing infrastructure, these cities experience higher year-round temperatures and more extreme heat days during the summer compared to surrounding areas, leading to increased health risks and discomfort for residents.

Partner:

- Gulf of Maine Research Institute

Earth Observations:

- Landsat 8 OLI
- Landsat 8 TIRS
- ISS ECOSTRESS
- Landsat 9 OLI-2
- Landsat 9 TIRS-2

Impact: Results from this project will help guide the GMRI's Urban Heat Island Mapping Project that will provide urban heat data for Portland and South Portland's OneClimate Future initiative and the Maine Won't Stop climate action plan.

Massachusetts – Boston

EARTH ACTION

Chatham County Health & Air Quality

Community Concern: Chatham County believes that there is an increasing frequency of heat events, that are unequally distributed throughout its communities. The County wants to better understand the impact of these events to prioritize mitigation efforts.

Partner:
- Chatham County, Georgia

Earth Observations:
- ISS ECOSTRESS
- Landsat 8 OLI & TIRS
- Landsat 9 OLI-2 & TIRS-2
- PlanetScope

Impact: Urban heat and canopy coverage maps will allow Chatham County to make informed decisions around building and land development code changes and apply for funding for heat mitigation projects.


Image Credit: Flickr

Virginia – Langley

NASA EARTH ACTION

Trinidad & Tobago Climate

Community Concern: The coastline of Trinidad & Tobago is essential to both the country's economy and livelihoods, and its blue carbon ecosystems. However, due to climate change coastline communities and ecosystems are vulnerable to sea level rise.

Partner:

- Institute of Marine Affairs

Earth Observations:

- Landsat 8 OLI
- Landsat 9 OLI-2
- Seninel-1 C-SAR
- Sentinel-2 MSI
- Capella X-SAR
- PlanetScope

Impact: Mapping historic coastline delineation and projecting sea level rise will inform the partner's shoreline monitoring efforts and will help understand future stats of their shoreline. This will help with shoreline management and restoration.

Alabama – Marshall

EARTH ACTION

San Bernadino Wildland Fires

Community Concern: Southern California is increasingly threatened by wildfires and the compounding hazards of drought and heatwaves, which impact human health and livelihoods. Quantifying the effects of prescribed burning on fuels and ecosystems is vital for informing management strategies.

Partners:

- USDA, US Forest Service, Wildland Fire Management R&D
- USDA, US Forest Service, San Bernardino National Forest
- San Bernardino Valley Municipal Water District
- California State University, San Bernardino, Institute for Watershed Resiliency
- California State University, Northridge, Center for Geospatial Science & Technology

Image credit: USDA

Earth Observations:

- ISS ECOSTRESS
- ISS EMIT
- Landsat 9 OLI-2
- Landsat 8 OLI
- UAVSAR

Impact: The fire fuel maps will help the end users quantify the impact of beneficial fires and analyze the pre-fire and post-fire landscapes for future fire prevention and management planning.

California – JPL

EARTH ACTION