PLANET TEXAS 2050

Fiscal Year 2025
Annual Report

Table of Contents

A resilient future for Texas is our grand challenge

Texas is growing fast — and so are the pressures on its natural resources, infrastructure, economy and communities. From record-breaking heat to historic floods, the state is experiencing more frequent and intense disruptions that pose serious risks to its long-term wellbeing.

Planet Texas 2050 is a university-wide research initiative working to build a more resilient and adaptive future for Texas. Spanning physical sciences, arts, social sciences and humanities, interdisciplinary teams collaborate with local governments, nonprofits and communities across the state to develop data-driven, community-informed strategies and solutions.

Stories of Ancient Resilience (SOAR) core research project co-lead Adam Rabinowitz (Classics, College of Liberal Arts) in the field.

By addressing urgent challenges like water security, public health, energy use and the future of cities, Planet Texas 2050 is transforming research into action, and creating the knowledge, tools and foresight Texans need to thrive today and for generations to come.

Planet Texas 2050
Highlights in Numbers

EXPANDING NETWORKS

155 active researchers

37 UT departments & disciplines

16 schools, colleges, & units

32 external partners

18 hosted events in the past year

ENGAGING STUDENTS

33 undergraduate & graduate student researchers

SCHOLARLY OUTPUT & PUBLICITY

23 scholarly works published in the past year*

11 news articles in the past year

BUILDING CAPACITY

$34M awarded in external funding to date

* acknowledging Planet Texas 2050 support

Program Achievements

Planet Texas 2050 advances its mission through a combination of interdisciplinary research, cross-sector collaboration and public engagement. In Fiscal Year 2025, the initiative's core research projects addressed critical dimensions of climate resilience across Texas, while other teams broadened impact through education, creative practice and policy engagement. Several projects also integrated efforts with municipal agencies and regional nonprofits, producing early-stage outputs designed for practical use, from public-facing visualizations and planning toolkits to biodiversity tracking systems and participatory design processes.

In addition to the flagship projects, Planet Texas 2050 supported a range of cross-cutting collaborations that link research with education, storytelling and practice-based research or scholarly creative work. This year's efforts included partnerships with K–12 educators, municipal staff and artists, as well as work across multiple research teams to coordinate community engagement and policy-oriented outputs.

Finally, the initiative's signature annual event, the Planet Texas 2050 Symposium, brought together researchers, practitioners and community partners to share findings, strengthen networks and discuss emerging needs and directions.

Collectively, these efforts reflect Planet Texas 2050's evolving approach: building not only new knowledge but also relationships, capacity and pathways for translating research into policy and practice.

Research

Planet Texas 2050's research efforts focus on building Texas's capacity to respond to environmental and social stressors through interdisciplinary, applied scholarship. In FY2025, the initiative's core projects advanced work in areas including urban resilience, public health, biodiversity monitoring and climate-informed design. Outputs ranged from AI-assisted wildlife tracking and hazard modeling to dashboards and toolkits developed with input from local stakeholders. These efforts drew on

partnerships with community organizations, city agencies and state institutions to ensure results were relevant and usable.

The following highlights illustrate how research supported by Planet Texas 2050 is advancing knowledge and delivering practical value for Texas communities.

AI-Enabled Model Integration for Complex Decision Making

The AI-Enabled Model Integration for Complex Decision Making (AIM) project develops computational tools that help communities better prepare for and respond to climate-related hazards. Co-led by **Suzanne Pierce** (Texas Advanced Computing Center), **Clint Dawson** (Oden Institute; Aerospace Engineering and Engineering Mechanics, Cockrell School of Engineering), **Katy Brown** (Oden Institute; Molecular Biosciences, College of Natural Sciences) and Francisco Guajardo (Museum of South Texas History), the AIM team uses AI to integrate modeling and community input to support decision-making in vulnerable regions such as the Rio Grande Valley.

City of Pharr representatives discuss the meaning of flood maps for the Rio Grande Valley region of Texas with UT's Nancy Carlson (Communication Studies, Moody College of Communication), far right.

In FY2025, AIM's coastal flooding models were expanded to include inland surge scenarios and their relationship to public health threats, such as neglected tropical diseases. The team collaborated with public health experts, local officials and the Museum of South

Texas History to understand how floodwater pathways and standing water could contribute to the spread of vector- and water-borne illnesses. These efforts support the development of open-source platforms like uP-STREAM (flood and surge modeling), Sites and Stories (community memory integration), DOLCE (ontology management) and the DataX Portal (data sharing and analysis).

This work reflects AIM's broader goal: creating tools that pair quantitative modeling with lived experience. For example, in Edinburg, Texas, AIM researchers are developing a digital twin of the city's downtown floodplain. This model will help planners visualize hazard exposure and assess potential responses, such as stormwater tunnels or improved drainage systems. Storytelling has become central to these efforts, as the team combines community narratives with sensor data to contextualize risk and resilience.

In parallel, AIM researchers are collaborating with the Texas Water Development Board to identify subsidence risks across the state and communicate flood risk more effectively in the Lower Rio Grande Valley. In Harris County, the team is working with the Flood Control District to support tunnel planning with scalable, AI-integrated model management services. Workshops hosted at the Museum of South Texas History gathered feedback from small business owners, public agencies and local residents on how to design communication tools that are accessible and meaningful across all users.

AIM team members also contributed to the broader Planet Texas 2050 network through capacity-building workshops led by Pierce and the TACC Decision Support Office. These sessions introduced Planet Texas 2050 researchers to best practices in data publishing, cyberinfrastructure tools and cross-platform integration — key steps toward building a shared technical foundation for sustaining interdisciplinary climate resilience research.

READ MORE

Equitable and Regenerative Cities in a Post Carbon Future

In FY2025, the Equitable and Regenerative Cities (ERC) flagship team, led by **Katherine Lieberknecht** (School of Architecture) and **Fernanda Leite** (Maseeh Department of Civil, Architectural and Environmental Engineering, Cockrell School of Engineering), completed its Resilience Hubs project in collaboration with the City of Austin's Office of Resilience and Climate Action. Findings from this project will directly inform the city's resilience hub strategy, expected to be implemented through municipal bond funding in 2026.

Complementing this work, the team launched the Resilience Navigation Portal, a disaster preparedness platform co-developed with residents and community organizations in Austin's Eastern Crescent. Funded by the National Science Foundation, the portal merges climate data with local knowledge, offering accessible and community-informed resilience tools. "You can get that level of granularity if you're able to connect with the residents that understand their neighborhood," Leite said. "We built this portal to be able to collect these data and train local residents for emergency readiness."

The Climate Navigators — residents and members of community organizations in Austin's Eastern Crescent — helped develop the Resilience Navigation Portal, a disaster preparedness platform funded by the National Science Foundation.

The ERC team also focused on work associated with the Southeast Texas Urban Integrated Field Lab (SETx-UIFL), a U.S. Department of Energy-funded initiative addressing flooding and air pollution risks in Southeast Texas. As part of SETx-UIFL, Leite's team conducted drone-based data collection and created augmented and virtual reality (AR/VR) visualizations, co-designed with community advisory groups. One of Lieberknecht's graduate students incorporated statewide water quality data into SETx-UIFL's analysis, further enriching the project's environmental assessments. Other graduate students helped survey community leaders about preferred flood and air quality strategies and assisted community members in their selection of two sites to serve as testbeds for flooding and air quality strategy development.

In addition to these data-driven efforts, the team collaborated with Planet Texas 2050 artist fellow Katy McCarthy, who conducted an oral history project with residents of Beaumont and Port Arthur. McCarthy documented local narratives and memories of the Neches River, culminating in the creation of a film called "Neches." This partnership contributed a cultural dimension to the flagship's broader climate resilience efforts in Southeast Texas.

READ MORE

Frontline Community Partnerships for Climate Action

The Frontline Community Partnerships for Climate Action project continued its work with residents of the Rio Grande Valley, emphasizing community-based participatory research (CBPR) as a strategy for addressing climate impacts through local leadership. Led by **Miriam Solis** (School of Architecture) and **Carmen Valdez** (Steve Hicks School of Social Work and Dell Medical School; now at UT School of Public Health San Antonio), the project engaged youth in Pharr, Texas, to document environmental inequities and articulate community-driven priorities through innovative methodologies including photovoice, oral histories and participatory mapping.

The culmination of this year's work was documented in a book published by the UT Center for American Architecture and Design, **"Planning with the Future:**

"You can get that level of granularity if you're able to connect with the residents that understand their neighborhood."
— Fernanda Leite, Cockrell School of Engineering

Environmental Justice through Youth Photovoice in Pharr" (right). The book featured photographs and narratives from youth co-researchers, who highlighted their concerns about the built environment and parks, emphasizing the need for safer infrastructure, improved maintenance and enhanced accessibility. The book also includes reflective essays by project leaders, situating the youth contributions within broader themes of environmental justice and community resilience.

The team also expanded its scope through new leadership and partnerships. **Maggie Hansen** (School of Architecture) joined the project as a co-lead, guiding a graduate studio focused on adapting green schoolyard policy for the Rio Grande Valley. Working with the Texas Children in Nature Network (TCiNN), the team produced a regional green schoolyard toolkit and co-founded the Pharr Eco Alliance to support ongoing local collaboration. The group also began examining the mental health effects of extreme heat on youth, contributed several manuscripts and initiated planning for a new community design project at Jones Box Park. In spring 2025, team members and partners traveled to Austin for a policy workshop aimed at strengthening advocacy skills and identifying paths from research to policy.

Networks for Hazard Preparedness and Response

This project, led by **Paola Passalacqua** (Maseeh Department of Civil, Architectural and Environmental Engineering, Cockrell School of Engineering) and **Patrick Bixler** (LBJ School of Public Affairs), tackles one of the most urgent climate challenges in Texas: how to prepare for and respond to increasingly frequent and complex hazards such as flooding, heat waves and pollution. Rather than treating these events as isolated

phenomena, the team takes a systems-level approach, studying how rivers, roads, terrain and communities interact under stress, and where vulnerabilities emerge.

This approach underpins their central role in the Southeast Texas Urban Integrated Field Laboratory (SETx-UIFL), a major Department of Energy-funded effort based in Beaumont and Port Arthur. There, the team integrates advanced modeling systems, more than 200 water level sensors, and mobile air-quality monitoring tools to understand and map the compounding risks of flood and pollution. A 2025 study led by the team showed that existing databases severely undercount such events, identifying up to five times as many multi-hazard events than previously recorded. Their updated models also redefined the scope of extreme heat exposure in the region, revealing over $300 million in unrecognized damage over the past two decades.

In the Beaumont–Port Arthur region, rich wetlands and bayous sit alongside one of the nation's busiest energy corridors, where biodiversity, industry and environmental risk converge, demanding both scientific insight and community input.

Community engagement is a cornerstone of this work. Through resident and technical task forces, local partners help shape the research, ground-truth findings and identify practical interventions. The team has developed a "strategy catalog" of potential mitigation actions, like pump retrofits and green infrastructure, and is working closely with communities to evaluate them based on cost, feasibility and local needs. This participatory framework ensures the science translates into tools and decisions that reflect real-world conditions.

In FY2025, the team continued publishing findings, developing new visualizations and strengthening connections with policymakers and regional stakeholders. New dashboards and 3D modeling tools are helping local officials and planners simulate risk and prepare for future scenarios. In parallel, Passalacqua and Bixler helped launch the LBJ School's new Extreme Weather Adaptation Lab and remain active in the UT-City CoLab. Their work exemplifies how integrated research, community partnership and systems thinking can lead to more effective climate resilience for more community members.

Read more

Resilient Species and Ecosystems

The Resilience in Species and Ecosystems (RISE) project is developing new ways to monitor and understand the effects of climate change and urbanization on Texas wildlife. Led by an interdisciplinary team of researchers — **Tim Keitt** and **Shalene Jha** (Integrative Biology, College of Natural Sciences), **Anthony Di Fiore** (Anthropology, College of Liberal Arts), **Preston Wilson** (Walker Department of Mechanical Engineering, Cockrell School of Engineering), and **Ashley Matheny** (Earth and Planetary Sciences, Jackson School of Geosciences) — RISE combines bioacoustic sensors, autonomous monitoring networks, ecological modeling and artificial intelligence to study changes in species distribution and ecosystem function. These tools are helping researchers investigate key indicators of environmental health, including the calls of iconic species like the golden-cheeked warbler and the shifting range of tropical birds such as the green jay.

Iconic species like the endangered golden-cheeked warbler (left) and the green jay (right) are among those being investigated by RISE researchers.

In FY2025, the team advanced its use of remote sensing technologies by deploying autonomous environmental sensors at Fennessey Ranch and the UT Marine Science Institute in Port Aransas. Collaborating with UT engineering groups, they continued refining compact, mobile sensors capable of localizing bioacoustic signals. They also partnered with the Texas Gulf Coast Restoration and Conservation project to build two wildlife tracking stations to monitor migratory birds, expanding RISE's capacity for long-term, data-rich biodiversity studies. "Being able to document just how sensitive the world is to changing climates and human activities is the first step to mitigating the negative effects we're having on the planet," Di Fiore said.

RISE researchers are applying these technologies across both urban and rural environments to improve conservation outcomes and inform nature-based solutions. One notable example is the team's collaboration with Texas Parks and Wildlife, the City of Austin and the Urban Wildlife Information Network to create best practices for wildlife monitoring in cities using autonomous sensors, AI and environmental DNA. Toolkits developed through these partnerships will support cities across Texas in scaling up their urban biodiversity strategies.

Informed by these field deployments, the team has also contributed to broader conservation planning efforts. A recent coastal bird monitoring workshop hosted at the UT Marine Science Institute brought together participants from 15 agencies to identify regional data needs and support coordination among land managers. This work reflects the Texas Gulf Coast Research Center's focus on supporting near-term decision-making for local municipalities and natural resource agencies. Internationally, the team is extending its sensing research to the Amazon through a new project funded by UT's Teresa Lozano Long Institute of Latin American Studies (LLILAS) seed grant program. In partnership with Universidad San Francisco de Quito, researchers are holding a sensing workshop at the Tiputini Biodiversity Station in Ecuador to explore applications of bioacoustic tools in tropical forest conservation.

READ MORE

"Being able to document just how sensitive the world is to changing climates and human activities is the first step to mitigating the negative effects we're having on the planet."

— Anthony Di Fiore, College of Liberal Arts

Stories of Ancient Resilience

The Stories of Ancient Resilience (SOAR) project explores how ancient communities adapted to environmental disruption — whether through infrastructure, mobility or culture — and what lessons their experiences might offer today. Led by **Adam Rabinowitz** (Classics, College of Liberal Arts), **Daniel Breecker** (Earth and Planetary Sciences, Jackson School of Geosciences), **Melissa Kemp** (Integrative Biology, College of Natural Sciences) and **Sheryl Luzzadder-Beach** (Geography and the Environment, College of Liberal Arts), the team draws on archaeological evidence, environmental proxies and historical narratives to reframe how we understand resilience across time.

This year, SOAR researchers advanced interdisciplinary work across three regions: Mesoamerica, the Roman frontier and Texas. In Mesoamerica, the Soils and Geoarchaeology Lab, directed by **Timothy Beach** (Geography and the Environment, College of Liberal Arts), field-checked an ancient Maya reservoir structure in Belize identified using LiDAR, collected and analyzed water and sediment samples from Maya archaeology sites, presented papers at several conferences and supported a post-doctoral researcher in the Department of Geography and the Environment to process archaeological LiDAR data from Guatemala and Belize.

At Histria, a Greek and Roman coastal city in modern-day Romania, Rabinowitz and his team extracted ancient DNA from burials in a Roman cemetery, acquired radiocarbon dates for those remains and used proteomics to determine human biological sex from their dental enamel. In the Breecker Lab, students measured isotopic compositions of human and animal tooth enamel from Histria and snail shells from Texas to track ancient mobility and environmental conditions.

In Texas, the team continued work on reconstructing past climates and ecological change using cave deposits and small-animal remains. Several manuscripts from the Kemp lab about the ancient salamander and lizard communities are forthcoming.

A team of researchers led by Adam Rabinowitz (wearing hat and blue shirt, inside the excavation unit) conduct fieldwork at the ruins of the ancient city Histria, in Romania, abandoned by its residents in the 7th century CE.

Spearheaded by Rabinowitz, SOAR also advanced a pilot Cultural Heritage Risk Map for Travis County, a tool that overlays archaeological and cultural landmarks with FEMA flood zones and wildfire risk. The project involves Planet Texas 2050 research scientist **Suzanne Pierce** (Texas Advanced Computing Center) and geospatial data coordinator **Alex Marden** (UT Libraries) and is part of a larger Planet Texas 2050 effort to integrate cultural data into climate resilience planning. A student from the Smart Cities Bridging Disciplines Program is contributing to data gathering and map development this year, while students in the Home to Texas first-year research initiative gathered information about cultural sites important to their communities across Texas.

In addition to research, the team is working on several new public engagement efforts, including immersive VR experiences of past landscapes in Texas and a storytelling initiative that connects past examples of adaptation with contemporary challenges. These efforts reflect the team's belief that long-term knowledge, when made accessible and relevant, can support more thoughtful decisions about the future.

READ MORE

Cross-Team & Creative Collaborations

Planet Texas 2050 supports multiple integrative efforts that transcend traditional research boundaries. These collaborations bring together artists, humanists, scientists, engineers and community partners to address complex challenges from multiple vantage points. In FY2025, these efforts produced new modes of engagement, expanded the reach of research teams and generated creative outputs that connect climate resilience to lived experience, cultural knowledge and public dialogue.

UT-City CoLab

Launched in 2024, the UT-City CoLab brings together researchers and city staff to better understand and respond to extreme weather risks at the neighborhood level. Led by **Dev Niyogi** (Earth and Planetary Sciences, Jackson School of Geosciences; Civil, Architectural, and Environmental Engineering, Cockrell School of Engineering), Patrick Bixler (LBJ School of Public Policy), Tim Keitt (Integrative Biology, College of Natural Sciences) and **Sergio Castellanos** (Maseeh Department of Civil, Architectural and Environmental Engineering, Cockrell School of Engineering), this partnership between Planet Texas 2050 faculty and the City of Austin is focused on making climate data more usable for local decision-making. In FY2025, the CoLab released a series of **seasonal climate outlooks**, including a winter forecast projecting warmer and drier conditions for Central Texas, and began field work on reflective pavement strategies to lower urban temperatures.

The 3D Austin Heat Map was born from the UT-City CoLab. (Credit: UT Ph.D. student Harsh Kamath)

Looking ahead, Niyogi will serve as a UNESCO Chair based at the University, with a focus on adapting the CoLab model for use in other urban regions.

READ MORE

Drama for Schools

Planet Texas 2050's partnership with Drama for Schools continued to explore the role of arts-integrated pedagogy in climate education and resilience building. Co-led by **Katie Dawson** and **Lara Dossett** (Theatre and Dance, College of Fine Arts) and **Stephanie Cawthon** (Educational Psychology, College of Education), the project engages teachers, artists and students in participatory research focused on climate change literacy and creative, curriculum-aligned learning.

In Fall 2024, the team worked with over 170 seventh graders and their teachers at the Ann Richards School for Young Women Leaders in Austin. The semester-long program incorporated role play, storytelling, visual arts and collaborative design challenges into lessons that aligned with state learning standards. Students explored water systems, sustainability and climate justice, applying cross-disciplinary knowledge to environmental questions with personal and local significance. "Drama-based strategies significantly enhanced student learning," said Christina Alvarez Ortiz, interim principal at Ann Richards. "The initiative empowered teachers and student leaders, creating an authentic learning environment."

"Drama-based strategies significantly enhanced student learning. The initiative empowered teachers and student leaders, creating an authentic learning environment."

— Christina Alvarez Ortiz, interim principal, Ann Richards School for Young Women Leaders

Students from the Ann Richards School for Young Women Leaders helped lead last winter's "Action Through the Arts" festival.

The program culminated in the "Action Through the Arts: Creating Constellations of Change" festival, where students performed and presented their research to sixth-grade peers, families, educators and community members. Teachers and students were active participants in the project's inquiry process, contributing data and analysis to inform ongoing research. Findings were presented at the **2025 Planet Texas 2050 Symposium**; the Society for the Psychology of Aesthetics, Creativity, and the Arts conference; and the International Drama in Education Research Institute at the University of British Columbia.
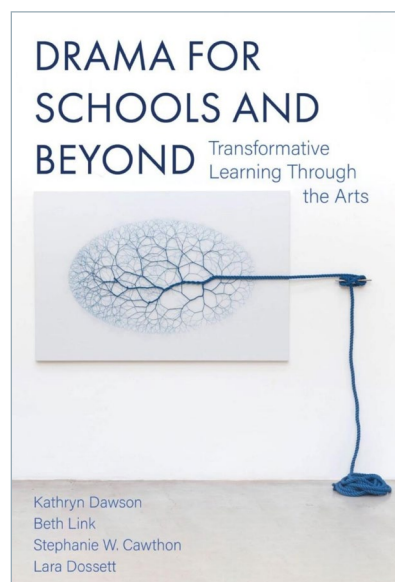
This model of co-designed, arts-integrated curriculum design is the subject of a new book to be published by the University of Chicago Press in Fall 2025: "**Drama for Schools and Beyond: Transformative Learning Through the Arts**" (right). Co-authored by Dawson, Dossett, Cawthon and PT2050 alumna Beth Link, the book presents both a research-informed framework and a practical resource for educators seeking to integrate the arts into interdisciplinary teaching.

READ MORE

Humanities & Artist Fellows

Planet Texas 2050 supports two ongoing programs that include creative practice and humanities scholarship as part of its interdisciplinary research: the Artist Fellowship and the PT2050 + Humanities Institute Faculty Fellows. These initiatives help connect artists and scholars with researchers and communities to explore new approaches to climate resilience.

In FY2025, the Artist Fellows contributed to a range of collaborative efforts. Juliet Whitsett was selected for the City of Austin's **TEMPO on the Trail** public art program and expanded her "Really Small Museum" series through an installation titled "ECO." She also worked closely with the Drama for Schools team (see above, page XX) as a guest artist at the Ann Richards School for Young Women Leaders. Miriam Conner partnered with the UT-City CoLab and the Equitable and Regenerative Cities in a Post-Carbon Future flagship on arts-based community engagement. Allison Orr and Forklift Danceworks collaborated with the Networks for Hazard

DRAMA FOR SCHOOLS AND BEYOND Transformative Learning Through the Arts

Kathryn Dawson
Beth Link
Stephanie W. Cawthon
Lara Dossett

Response team and **Stuart Reichler** (College of Natural Sciences) on "The Way of Water: Colorado River." Katy McCarthy traveled with the ERC and SETx-UIFL teams to Southeast Texas, where she developed an oral history project that informed her new film "**Neches**."
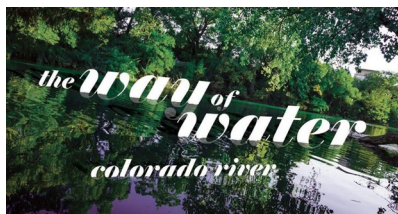
Counterclockwise from top: A featured exhibit in Artist Fellow Juliet Whitsett's "Really Small Museum" series, located in two East Austin neighborhoods; a promotional image for" The Way of Water: Colorado River" performance; a still from Artist Fellow Katy McCarthy's film "Neches."

Meanwhile, this year's Planet Texas 2050 + Humanities Institute Faculty Fellows pursued a range of research projects examining the social, cultural and historical dimensions of climate resilience. Projects addressed topics such as urban change, settler colonialism, gigacity development, migration, environmental memory and multispecies relations. Fellows drew on methods including oral history, speculative fiction, performance, digital storytelling and spatial analysis to explore how communities navigate environmental and climate-related challenges:

- **Paul Adams** (Geography and the Environment, College of Liberal Arts) focuses on developing new geospatial representations that integrate qualitative and quantitative data to better understand how people perceive and interact with climate and environmental change.
- **Alex Beasley** (American Studies, College of Liberal Arts) is completing a monograph on the post-World War II oilfield services industry and its influence on U.S. power, labor, and environmental risk perception, while laying groundwork for a collaborative public humanities project on how different actors define and respond to environmental risk.

- **Rosemary Candelario** (Theatre and Dance, College of Fine Arts) recorded and analyzed soundscapes along the Texas–Mexico border to explore cultural and ecological connections.
- **Leah Cox** (Theatre and Dance) focused on the creation of heterogenous sites for experimentation and relationship-building through multiple workshops and an immersive dance theatre performance.
- **Craig Campbell** and **Randy Lewis** (Anthropology, College of Liberal Arts) and Florian Grundmüller (University of Göttingen) — together, the **Gigacities Collective** — study the cultural, economic and environmental effects of industrial megaprojects in Texas.
- **Aleksandra Jaeschke** (School of Architecture) is researching the ecological potential of agricultural byproducts and developing an illustrated book that explores architecture's material impacts, with plans to prototype a site-grown, straw-bale structure.
- **Jiabao Li** (School of Design and Creative Technologies, College of Fine Arts) uses immersive art and design to prompt public engagement with climate change and possible futures.
- **Kristin Lucas** (Art and Art History, College of Fine Arts) is the creator of "Sun Screenings," a solar-powered platform for experimental media and time-based art that aligns programming with ecological and celestial rhythms to foster public engagement with environmental change.
- **Laurel Mei-Singh** (Geography and the Environment) leads a multi-phase project combining documentary film, curriculum and public dialogues to address the environmental impacts of U.S. military occupation in Hawai'i and support Native Hawaiian-led efforts to restore sacred lands at Makua.
- **Cathryn Ploehn** (School of Design and Creative Technologies) is partnering with **Festival Beach Food Forest** and the Keitt Lab to collect and visualize data on community "gifts" and microclimate impacts, creating public, participatory experiences that link environmental sensing with embodied climate literacy.

- **Marina Peterson** (Anthropology) is co-editing a chapbook series, "Errant Elements," in which scholars and artists explore the material, cultural and ecological dimensions of elements from the periodic table.
- **Donnie Johnson Sackey** (Rhetoric and Writing) is investigating how user experience design and participatory methods can improve federally mandated water quality reports to increase public understanding, trust, and engagement in water governance.
- **Januibe Tejera** (Butler School of Music, College of Fine Arts) is exploring how ecological concerns can be understood, expressed and transformed through sound, specifically through artistic and compositional models.
- **Pavithra Vasudevan** (Center for Women's & Gender Studies, African & African Diaspora Studies, College of Liberal Arts) is writing a book, "A Toxic Alchemy," that examines the entangled histories of race, toxic exposure, and industrial development, focusing on how environmental harm is unevenly distributed along racial and class lines.

Resilience Research in Action

In February 2025, the annual Planet Texas 2050 Symposium brought together researchers, policymakers, educators and community representatives to discuss current findings and strategies for climate resilience in Texas. Jonathan Gilligan, professor of earth and environmental sciences at Vanderbilt University, opened the event with a keynote titled "Sustainability Across the University," which emphasized interdisciplinary collaboration as essential to sustainable practices. Panels during the symposium examined specific climate challenges, including a session on artificial intelligence's role in advancing clean energy and its impacts on grid reliability, equity and innovation. A conversation between journalist Megan Kimble and LBJ School Dean **J.R. DeShazo** addressed Texas's evolving insurance market in the context of climate risk.

Students from the Ann Richards School for Young Women Leaders performed and presented their research at the 2025 Planet Texas 2050 Symposium.

The symposium also incorporated creative and educational activities intended to deepen participant engagement. Seventh graders and teachers from Austin's Ann Richards School for Young Women Leaders presented their work from the Drama for Schools initiative, demonstrating the application of arts-based methods to climate education. Additionally, the event included poetry readings and a recitation of the Dr. Seuss classic The Lorax, highlighting themes of environmental action and sustainability.

Planet Texas 2050 Headlines

UT Austin News Coverage

12/8/2024 **UT-City Climate Partnership Thrives**
Jackson School of Geosciences News

External Features and Mentions

9/9/2024 **Why cities are getting more rainy**
Washington Post

3/1/2025 **UT-City Climate CoLab featured as endorsed project**
World Meteorological Organization Weather Research Programme

8/12/2025 **Texas is a leader in flood research, but more coordination is needed**
Dallas Morning News

UT OVPR Communications

9/9/2024 **Passing the Torch**

12/19/2024 **RISE and Shine**

4/29/2025 **Navigating Climate Challenges**

7/14/2025 **Learning Through Drama: Transforming Classrooms and Communities Across the Globe**

7/29/2025 **Southeast Texas Rising: Science and Community in Motion**

8/6/2025 **Merging AI, Storytelling and Community for a More Resilient Texas**

8/20/2025 **Digging Into the Past to Prepare for the Future**

Creating Connections

Planet Texas 2050 is grounded in collaboration. Its growing network spans nearly every college and school at UT Austin, from the Cockrell School of Engineering and the Moody College of Communication to the College of Fine Arts and the School of Architecture. The program brings together researchers from across disciplines to develop actionable, community-centered responses to Texas's climate and infrastructure challenges.

That commitment to collaboration also extends far beyond the University. In FY2025, Planet Texas 2050 continued building strong relationships with community partners, school districts, other universities, state and local agencies, nonprofit organizations, museums and artists. These connections have helped shape research agendas, amplify impact and ensure that resilience strategies are rooted in local knowledge and priorities.

Explore these connections using our **interactive network map**, which visualizes the people, projects and partnerships that define Planet Texas 2050. You can search by name, unit or project — or click any node to explore its connections.

Funded Grants

To date, Planet Texas 2050 researchers have secured more than $34.7 million in external funding through grants, gifts and awards that directly support the initiative's mission. External awards from the most recent fiscal year are listed below.

City of Austin
University of Texas–City of Austin Climate CoLab
$350,000
Dev Niyogi, Jackson School of Geosciences

National Science Foundation (Directorate for Geosciences)
Collaborative Research: Understanding Cascading Feedbacks Between Human Decision Making and Delta Morphodynamics with Community-Engaged Modeling
$298,800
Paola Passalacqua, Cockrell School of Engineering

Houston Flood Control District
SAFER – Model Management and Scalable Execution Environments
$156,300
Suzanne Pierce, Texas Advanced Computing Center

Texas Water Development Board
TWDB: Subsidence data management services
$191,000
Suzanne Pierce, Texas Advanced Computing Center

Texas Water Development Board
Communicating Flood Risk in the Lower Rio Grande Valley
$90,000
Keri Stephens, Moody College of Communications

Planet Texas 2050 Partners

Ann Richards School for Young Women Leaders

AISD

ARISE Adelante

AT&T

Austin Common

Austin Public Health

Austin Watershed Protection

City of Austin Office of Resilience and Climate Action

City of Pharr

Community Coalition for Health

Community Resilience Trust

Creative Policy

EcoRise

Forklift Danceworks

GAVA (Go Austin/Vamos Austin)

Giddyup Studios

Indigenous Cultures Institute

Keep Pharr Beautiful

La Unión del Pueblo Entero (LUPE)

Lady Bird Johnson Wildflower Center

Microsoft

Museum of South Texas History

Pharr-San Juan-Alamo ISD

Resilient Future Studio

Texas Children in Nature Network

Texas Target Communities

Texas Nature Conservancy

Texas Parks and Wildlife

Texas Water Development Board

The Trail Conservancy

Travis County

Urban Wildlife Information Network

Publications

Planet Texas 2050 researchers advanced knowledge through successful multidisciplinary collaborations, leading to a wide range of peer-reviewed publications and conference presentations. The list below highlights the breadth of publications from the past fiscal year; all are available online.

Azizi, K., Wang, Y., Enriquez, O., Passalacqua, P., Niyogi, D., & Bixler R.P. (2025). Integrating Perspectives: Multi-Sectoral Insights into Gulf Coast Flood Governance, International Journal of Disaster Risk Reduction, 127, 105662.

Banks, T. (2024). Priorities for the built environment. In M Solis & C.R. Valdez (Eds.) Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. (pp 36-59). Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

Chatham, A, Rodriguez, E. & Olivia, M (2024). Youth engagement and environmental Justice. In M Solis & C.R. Valdez (Eds.) Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. (pp 24-35). Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

Chatham, A. & Flores, L. (2024). Future impact. In M Solis & C.R. Valdez (Eds.) Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. (pp 8-95). Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

* Cheng, C. S., Luo, L., Murphy, S., Lee, Y. C., & Leite, F. (2024). A framework to enhance disaster debris estimation with AI and aerial photogrammetry. International Journal of Disaster Risk Reduction, 107, 10446

* Contina, A., Yanco, S. W., Pierce, A. K., Vander Zanden, H. B., Stricker, C. A., Bowen, G. J., & Wunder, M. B. (2025). Dynamic environments generate geographic fluctuations in population structure of an inland shorebird. Ecosphere, 16(6), e70312.

* Dai, T. Y., Niyogi, D., & Nagy, Z. (2025). CityTFT: A temporal fusion transformer-based surrogate model for urban building energy modeling. Applied Energy, 389, 125712.

Dawson, K., Link, B., Cawthon, S. W., & Dossett, L. (2025). Drama for Schools and Beyond: Transformative Learning Through the Arts. Intellect Ltd.

Harrison-Buck, E., Krause, S. M., Brouwer Burg, M., Willis, M., Perrotti, A., & Bailey, K. (2024). Late Archaic large-scale fisheries in the wetlands of the pre-Columbian Maya Lowlands. Science Advances, 10(47), eadq1444.

Hwang, H., Anderson, K. F., Vedlitz, A., & Bixler, R. P. (2024). Unveiling health inequities: Exploring the role of social capital and public trust in bridging racial disparities in health-care coverage for Hispanics. Social Science Quarterly, 105(6), 938-1952.

Kamath, H.G., Singh, M., Malviya, N., Martilli, A., He, L., Aliaga, D., He, C., Chen, F., Magruder, L.A., Yang, Z.L. and Niyogi, D. (2024). GLObal Building heights for Urban Studies (UT-GLOBUS) for city-and street-scale urban simulations: Development and first applications. Scientific Data, 11, 886.

Mondal, N., Anand, P., Khan, A., Deb, C., Cheong, D., Sekhar, C., Niyogi, D. & Santamouris, M. (2024). Systematic review of the efficacy of data-driven urban building energy models during extreme heat in cities: Current trends and future outlook. In Building Simulation, 17(5).

Pérez-Quiñones, K.A. (2024). Priorities for park planning and care. In M Solis & C.R. Valdez (Eds.) Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. (pp 60-87). Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

Petruzzi, L. J., Errisuriz, V. L., Valdez, C. R., & Parra-Medina, D. (2025). The role of perceived neighborhood factors and the built environment on depression and stress among Latinas on US-Mexico border. Journal of Community Psychology, 53.

Preisser, M., & Passalacqua, P. (2025). Remote sensing improves multi-hazard flooding and extreme heat detection by fivefold over current estimates. AGU Advances, 6, e2025AV001667.

Solis, M (2024). Youth and environmental action. In M Solis & C.R. Valdez (Eds.) Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. (pp 6-15). Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

Solis, M., & Valdez, C.R. (Eds.). (2024). Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

Solis, M., Morales, S., Cohen, N., Pérez-Quiñones, K., Chatham, A., Hagerman, J., Oliva, M., & Valdez, C. R. (2024). Young Latinas/os' environmental commitments: The case of waste. Urban Planning, 9, 8704.

Solis, M., Pérez-Quiñones, K. A., Chatham, A. A., Banks, T., Levine, K., Lowell, J., & Valdez, C. R. (2024). Minoritised youth's environmental justice priorities in a gentrifying context: Brokenness and repair. Local Environment, 29(11), 1451-1469.

Valdez, C.R. (2024). Photovoice in Pharr. In M Solis & C.R. Valdez (Eds.) Planning with the Future: Environmental Justice through Youth Photovoice in Pharr. (pp 16-23). Austin, TX: Center for American Architecture and Design at The University of Texas at Austin School of Architecture.

* Ye, X., Yigitcanlar, T., Xu, Y., Head, M., Hang, Y., Sanchez, T., Gong, W., & Niyogi, D. (2025). Urban planning and IPCC-like city assessments integration for climate-resilient cities. Environment and Planning B: Urban Analytics and City Science,0(0), 23998083251330940.

Planet Texas 2050 Team

Theme Organizing Committee — PT2050's Executive Leadership Team

Patrick Bixler (Co-Chair)
LBJ School of Public Affairs

Katherine Lieberknecht (Co-Chair)
School of Architecture

Katie Dawson
Theatre and Dance
College of Fine Arts

Tim Keitt
Integrative Biology
College of Natural Sciences

Dev Niyogi
Earth and Planetary Sciences
Jackson School of Geosciences
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Paola Passalacqua
Past Chair (FY23 – 24)
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Suzanne Pierce
Texas Advanced Computing Center

Adam Rabinowitz
Past Chair (FY22)
Classics
College of Liberal Arts

Carmen Valdez
School of Public Health
UT Health San Antonio

Flagship Project Co-Leads

Planet Texas 2050 researchers are dedicated to strengthening Texas's resilience and capacity to adapt in the face of rapid growth and climate change. Through a suite of innovative, interdisciplinary projects, they're harnessing the diverse skills and knowledge across their research network to develop practical tools, programs and policy guidance aimed at addressing some of the state's most pressing challenges.

AI-enabled Model Integration for Complex Decision Making

Katy Brown
Molecular Biosciences
College of Natural Sciences
Oden Institute for Computational
Engineering & Sciences

Clint Dawson
Aerospace Engineering & Engineering
Mechanics
Cockrell School of Engineering
Oden Institute for Computational
Engineering & Sciences

Suzanne Pierce
Texas Advanced Computing Center

Equitable and Regenerative Cities in a Post-Carbon Future

Fernanda Leite
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Katherine Lieberknecht
School of Architecture

Frontline Community Partnerships for Climate Justice

Maggie Hansen
School of Architecture

Miriam Solis
School of Architecture

Carmen Valdez
School of Public Health
UT Health San Antonio

Networks for Hazard Preparedness and Response

Patrick Bixler
LBJ School of Public Affairs

Paola Passalacqua
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Resilience in Species and Ecosystems

Anthony Di Fiore
Anthropology
College of Liberal Arts

Shalene Jha
Integrative Biology
College of Natural Sciences

Tim Keitt
Integrative Biology
College of Natural Sciences

Ashley Matheny
Earth and Planetary Sciences
Jackson School of Geosciences

Preston Wilson
Walker Department of Mechanical
Engineering
Cockrell School of Engineering

Stories of Ancient Resilience

Daniel Breecker
Earth and Planetary Sciences
Jackson School of Geosciences

Melissa Kemp
Integrative Biology
College of Natural Sciences

Sheryl Luzzadder-Beach
Geography and the Environment
College of Liberal Arts

Adam Rabinowitz
Classics
College of Liberal Arts

Additional Team Members

Paul Adams
Geography and the Environment
College of Liberal Arts

David Arctur
Center for Water and the Environment
Cockrell School of Engineering

Christina Bain
Art and Art History
College of Fine Arts

Jay Banner
Earth and Planetary Sciences
Jackson School of Geosciences

Matt Bartos
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Timothy Beach
Geography and the Environment
College of Liberal Arts

Alex Beasley
American Studies
College of Liberal Arts

Christopher Bell
Earth and Planetary Sciences
College of Liberal Arts

Michelle Bertelson
Lady Bird Johnson Wildflower Center
College of Natural Sciences

Casey Boyle
Rhetoric and Writing
College of Liberal Arts

Steven Boyles
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Naomi Campa
Classics
College of Liberal Arts

Craig Campbell
Anthropology
College of Liberal Arts

Rosemary Candelario
Theater and Dance
College of Fine Arts

Sergio Castellanos
Maseeh Department of Civil,
Architectural and Environmental
Engineering
Cockrell School of Engineering

Stephanie Cawthon
Educational Psychology
College of Education

Leah Cox
Theatre and Dance
College of Fine Arts

Lara Dossett
Theatre and Dance
College of Fine Arts

Ken Dunton
Marine Science Institute
College of Natural Sciences

Harry Evans
Center for Water and the Environment
Cockrell School of Engineering

Caroline Farrior
Integrative Biology
College of Natural Sciences

Lydia Fletcher
Texas Advanced Computing Center

Kate Freer
Theater and Dance
College of Fine Arts

Tom Garrison
Geography and the Environment
College of Liberal Arts

Erica Gionfriddo
Theatre and Dance
College of Fine Arts

Suchi Gururaj
Office of the Vice President of Student
Affairs

John Hasenbein
Walker Department of Mechanical
Engineering
Cockrell School of Engineering

Donalyn Heise
Art and Art History
College of Fine Arts

Michael Holleran
School of Architecture

Mevin Hooten
Statistics and Data Science

College of Natural Sciences

Heather Houser
English
College of Liberal Arts

Yasmiyn Irizarry
African and African Diaspora Studies
College of Liberal Arts

Aleksandra Jaeschke
School of Architecture

J.E. Johnson
Theatre and Dance
Texas Performing Arts
College of Fine Arts

Erhan Kutanoglu
Walker Department of Mechanical
EngineeringCockrell School of
Engineering

Becky Lentz
LBJ School of Public Affairs

Randolph Lewis
American Studies
College of Liberal Arts

Rebecca Lewis
Anthropology
College of Liberal Arts

Jiabao Li
School of Design and Creative
Technologies
College of Fine Arts

Ji Ma
LBJ School of Public Affairs

David Maidment
Center for Water and the Environment
Cockrell School of Engineering

Katy McCarthy
College of Liberal and Fine Arts
UT San Antonio

Elena McDonald-Buller
Center for Energy and Environmental
Resources
Cockrell School of Engineering

Laurel Mei-Singh
Geography and the Environment
College of Liberal Arts

William Mobley
Texas Advanced Computing Center

Vagheesh Narasimhan
Integrated Biology
College of Natural Sciences

Michael Oden
School of Architecture

Chrysoula Panethymitaki
Oden Institute for Computational
Engineering & Sciences
Cockrell School of Engineering

Lissa Pearson
Texas Advanced Computing Center

Robert Paterson
School of Architecture

Geeta Persad
Earth and Planetary Sciences
Jackson School of Geosciences

Marina Peterson
Anthropology
College of Liberal Arts

Kelly Pierce
Texas Advanced Computing Center

Cathryn Ploehn
School of Design and Creative
Technologies
College of Fine Arts

Ashanté Reese
African and African Diaspora Studies
College of Liberal Arts

Arlene Rosen
Anthropology
College of Liberal Arts

Stanley Roux
Integrative Biology
College of Natural Sciences

Astrid Runggaldier
Art and Art History
College of Fine Arts
The Mesoamerica Center

Mike Ryan
Integrative Biology
College of Natural Sciences

Donnie Sackey
Rhetoric and Writing
College of Liberal Arts

Roxanne Schroeder-Arce
Theatre and Dance
College of Fine Arts

Tim Shanahan
Earth and Planetary Sciences
Jackson School of Geosciences

Michael Shensky
UT Libraries

Bjørn Sletto
School of Architecture

Max Snodderly
Center for Perceptual Systems
College of Liberal Arts

Stacey Sowards
Communication Studies
Moody College of Communication

Keri Stephens
Communication Studies
Moody College of Communication

David Stuart
Art and Art History
College of Fine Arts
The Mesoamerica Center

Rabun Taylor
Classics
College of Liberal Arts

Januibe Tejera
Butler School of Music
College of Fine Arts

Christine Thies
Center for Water and the Environment
Cockrell School of Engineering

Amy Thompson
Geography and the Environment
College of Liberal Arts

Fred Valdez
Anthropology
College of Liberal Arts

Eirik Valseth
Computational Hydraulics Group
Oden Institute for Computational
Engineering & Sciences

Pavithra Vasudevan
African and African Diaspora Studies
Center Women's and Gender Studies
College of Liberal Arts

Jim Walker
Office of Sustainability

Gordon Wells
Center for Space Research

Amy Wolf
Integrative Biology
College of Natural Sciences

Zong-Liang Yang
Geological Sciences
Jackson School of Geosciences

Michael Young
Bureau of Economic Geology
Jackson School of Geosciences

Support Team

Heidi Schmalbach
Planet Texas 2050 Program Director
Office of the Vice President for Research,
Scholarship and Creative Endeavors

Jonathan Lowell
Engagements and Programs
Coordinator
Office of the Vice President for Research,
Scholarship, and Creative Endeavors