COMMUNITY MEMBERS DESCRIBE COMPLEX ENVIRONMENTAL CHALLENGES OF SOUTHEAST TEXAS

SOUTHEAST TEXAS
URBAN INTEGRATED FIELD LAB

WHY NOW?

Gulf Coast communities, including Southeast Texas, are experiencing growing environmental challenges that are complex and often hard to describe. When problem-solving begins with residents and researchers defining challenges together, research outputs are more impactful and useful for local communities . The SETX-UIFL began by asking community members to define environmental challenges in their region.

Physical infrastructure	redesign streets to reroute water; better manage flow of water both day-to-day and during storms; keep people/move people out of areas that flood repeatedly; ensure that places of work are safe from flooding, too (not only residential areas); interest in making floodwater detention areas multifunctional/dual use; focus on nature-based solutions in addition to drainage infrastructure.
Social infrastructure	better evacuation routes and communication about those routes; preparedness exercise and drills; public education and outreach about preparedness, response, recovery; clearer, simpler communication; better outreach and accessibility about existing information and data.
Knowledge	more research needed to better understand combined impact of different types of risk (air quality, flooding, etc.; air, water, soil) and local data about air and water quality.
Planning	better land use planning and future development; a new vision for the community that reduces fossil fuel dependance and that focuses on where it is safe to live; moving people out of harm's way.
Regulatory changes	improved laws to prevent pollution; enforcement of existing laws.
Scale	concern that building and development in the upper watershed is making flooding worse in Southeast Texas
Just transitions	moving away from fossil fuel use and an economy based on their use; need investment from rest of the state and US: Southeast Texas produces a lot of economic value but does not get much respect or investment in return
Concerns about strategies	concerns that recommended strategies will be too expensive, not cost effective, or that they will have a negative impact on jobs and industry; perception that environmental regulations prevent needed drainage improvements and needed dredging; current cost-benefit ranking for funding doesn't take industrial infrastructure into account—just residential areas

Task Force ideas for potential solutions or strategies to address problems defined by members.

WHAT WE DID

The research team used a "Task Force" model of local stakeholder participation, alongside surveys and focus groups, to understand residents' definitions of environmental challenges. Texas Target Communities helped facilitate the process and suggested the Task Force structure. The Task Force model convenes 8-12 members who represent larger communities from the project area; this size allows for participation from a diversity of groups while remaining small enough for discussion, collaboration, and trust-building. We created a "Technical Task Force" of 8-12 environmental professionals from local government, industry, and the nonprofit sector, and a "Community Organization Leaders Task Force" of 8-12 community-based organization representatives.

WHO WAS INVOLVED?

The research team used surveys and focus groups, including opportunities to share through written, visual, and small and large group activities, to gather input on how to describe, interpret, and describe and define local environmental challenges. The two Task Force groups met separately and shared ideas through discussion and written comments. Then the research team convened a large group discussion with Task Force members serving as discussion leaders. The researchers analyzed the focus group notes and developed lists of common themes.

	Positive aspects	Negative aspects	Changes to the project by researchers, in response to input from Task Force
Air quality	Refineries are a source of jobs, economic strength, and national importance	Refineries are a source of pollution	Added air pollution strategies to co-production focus, which originally had focused only on flooding strategies
Health	n/a	Linked to air quality Linked to aging housing stock Linked to water quality	Health impacts were not emphasized at the proposal stage, but in response to Task Force input, the larger research team expanded focus to include health data
Water quality	n/a	Linked to aging housing stock Linked to aging infrastructure	Concerns about water quality and housing stock not included at the proposal stage; in response to Task Force input, a PhD student associated with the team shifted focus of their research to include water quality
Community	Strong, connected, caring community	At risk of harm from air pollution, flooding, restructuring of the economy, aging housing stock and infrastructure	In response to Task Force input, the larger research team increased focus on health aspects of air pollution
Economy	The region is an important provider of products for the US and global markets	The region is a sacrifice zone: people outside the area don't fully recognize these economic contributions and their associated harms; this pattern repeats at smaller scales within the region (for example, Port Neches very high cancer rates)	Developed strategies at both the regional and also the local level; broadened focus of strategies beyond just flooding
Nature	Nature is an asset that provides benefits such as fishing, crabbing, recreational spaces, clean air and water provisioning, flood protection, etc.	Nature is a source of risk and harm (for example, flooding, heat exposure, mosquito-borne illness)	In response to Task Force input, the larger research team added a co-led pilot project focused on redesigning an abandoned golf course for increased nature access and recreation
Flooding	n/a	From hurricanes and tropical storms From inadequate drainage infrastructure From riverine flooding From upstream communities	Inadequate drainage infrastructure and relationship to upstream communities not included at the proposal stage but were identified by Task Force members; the overall research team shared these additional flooding concerns shared with sub-team doing the flood modeling
Strategies to address flooding and air quality	Physical infrastructure: grey and green Potential for green infrastructure to be multifunctional and provide co-benefits Social infrastructure (for example, communication and outreach improvements)	n/a	Proposal focused on physical infrastructure strategies; in response to Task Force input, the overall research team expanded strategy focus to include social infrastructure (for example, communication and outreach plans, K-12 education about flooding, etc.). For example, the overall research team added new project outputs to address this feedback, including a podcast series about the research, one-page communication briefs about each research output for public dissemination, a college design studio capstone class focused on community engagement and outreach, and a subproject focused on plan analysis.

Positive aspectsSummary: problem definitions by Task Force members (from survey and focus group input) and changes to the project made by the larger research team, in response to Task Force input.

FINDINGS

Community members warmly described their community as caring and connected, with a strong economy and a vibrant ecosystem. Community members' input reflected the complexity of challenges: • Refineries that contribute jobs but also pollution; • the need for physical infrastructure but also "green strategies," educational outreach, and communication; • The desire for residents to stay in the community, despite concerns about health Impacts, housing quality, and flooding; and • Nature perceived as a refuge but also as a source of risk. Community members provided important context about flooding, such as localized drainage problems as well as storm-related impacts on lower-income households and communities of color. Members also focused on air quality pollution and associated health impacts, including cancer rates. Several community members shared that Southeast Texas functions as a "sacrifice zone," providing products for US and global markets, with little recognition of these contributions or their associated harms. Another common theme was a lack of accessible, publicly shared knowledge about air quality and flooding.

MORE ABOUT SETX-UIFL

The Southeast Texas Urban Integrated Field Lab (SETx-UIFL) is one of four projects funded in 2022 by the U.S. Department of Energy to study how climate, environment, and urban changes affect cities. A team of over 80 researchers from UT, Lamar University, Texas A&M, Prairie View A&M, Oak Ridge National Lab, and Los Alamos National Lab has collected data and conducted modeling across hazards including flooding, hurricanes, heat stress, and air quality. Our Why: Southeast Texas faces numerous hazards, yet smaller communities like this one have often felt forgotten compared to larger cities. The SETx-UIFL was designed to explore the complex dynamics of disaster vulnerability for this economically and culturally vibrant region. We believe Southeast Texas is a bellwether for the entire Gulf Coast, and an exemplar for strategies that protect people and places. We hope this effort supports your path toward lasting resilience.

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