

Water, Equity, and Sustainability in Texas

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HARC

Agenda

- Major equity & sustainability concerns
- Policy, planning, & regulation
- Challenges & opportunities
- Recommendations

This presentation is based on:

Cook, M. A., Tremaine, D. M., Wyatt, B. M., Banner, J. L., Charles, J., Berg, M. Bruno, T., Glazer, Y. R., Callison, C., Mace, R. E., Miller, V., Bare, R., Sanchez Flores, R., Seefeldt, J., Fuller, A., and Niyogi, D., 2023., Addressing challenges to ensuring justice and sustainability in policy and infrastructure for Texas water resources in the 21st century. (in review)



Major Equity & Sustainability Concerns

Infrastructure degradation, water access, affordability, contamination, flooding



Policy, Planning, & Regulation

State & regional water management, drought planning, flood planning, climate adaptation & planning, transboundary waters



Challenges & Opportunities

Nature-based solutions, One Water



Recommendations

Equity in spending gov't funds, incorporating community voice, identifying and dismantling causes of inequities



Infrastructure Degradation

- Corrosion, aging
- Water leaks
 - Over 186 billion gallons of water leaks from Texas municipal water systems – about 51 gallons per water service line
 - Might supply surface water or groundwater during drought
 - Sewage overflows
 - Makes water more expensive to supply
 - Alter environmental water quality
- Corrosion leads to water contamination



Water Access



- About 44,000 households (0.4% of Texans) lack access to plumbing
- Insecure access to water in underserved communities
 - Colonias
 - Unincorporated communities
 - Mobile homes
 - Rural areas
 - Unhoused residents
- Historic disenfranchisement
- Communities seek unsafe water sources, bottled sources

Water Affordability

- Household unaffordability
 - ~12% of households in 2017 viewed water bills as unaffordable
 - Puts households at risk of loss of service/limits access
 - Households might ration, seek unsafe sources
- Community unaffordability
 - Expensive to keep up w/ regulations, upgrades, etc.
 - Leads to higher water bills



Water affordability limits water access

Image from: Wikimedia Commons



Water Contamination

- Boil water notices, sanitary sewer overflows, and lead in drinking water
- Industrial facilities or activities, agricultural runoff, or waste from agricultural practices impact surface & groundwater
- Disproportionately more likely to impact underserved communities
- Erode trust in water services
- Few small water systems have tech to treat contaminants of emerging concern

Flooding

- Texas outranks all other states in deaths, injuries, and loss of property due to flood
 - 17% of all flood-related fatalities nationwide, 2010–2022
- Coastal counties & counties along Rio Grande rank highest in US for flood risk
- Wetlands, green infrastructure limit some flood impacts
 - Less likely to be in underserved areas
- Disparities in flood relief funding allocation



Flooded highway in Houston

Policy, Planning, & Regulation

- Policy, planning, and regulation are challenges
 - May be under-enforced, leaving communities under-protected
- Also routes to solutions





Texas State Capitol

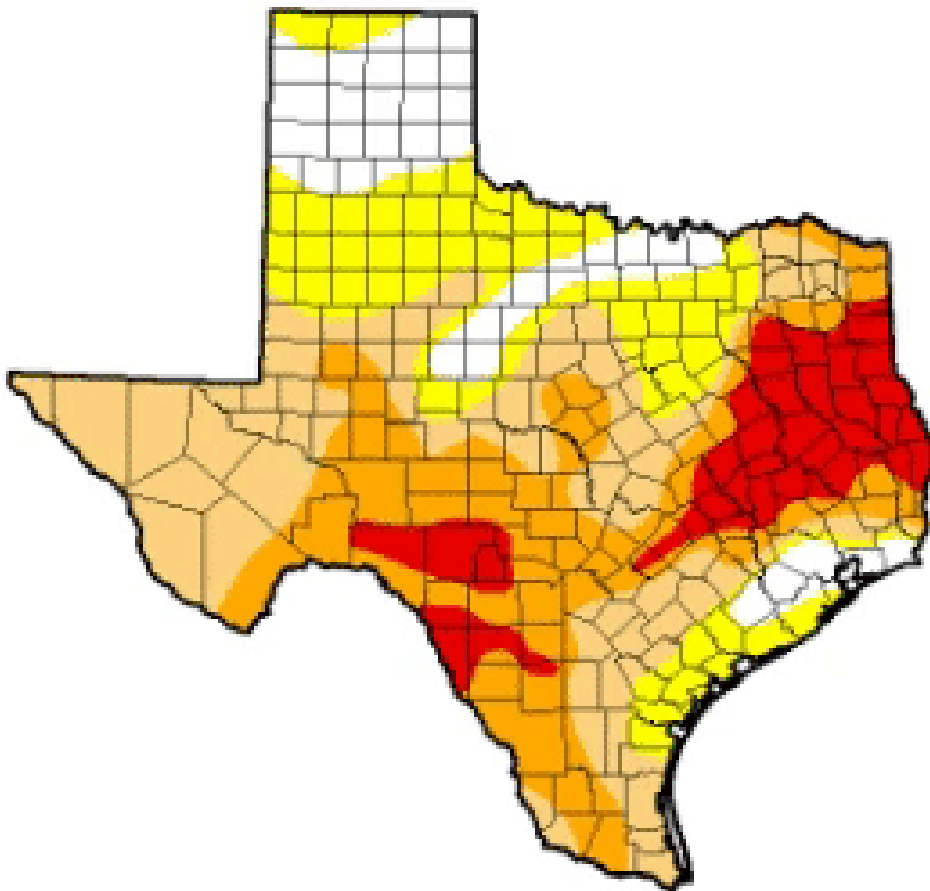
Image from: Wikimedia Commons

State & Regional Water Management

- Prior Appropriation & Rule of Capture
 - Some riparian rights for household or livestock
 - Adjudicated water rights in Rio Grande
- Rainwater, overland flow, runoff owned by landowner
 - Rainwater harvesting allowed
- Environmental flows added later

Drought Planning

U.S. Drought Monitor Texas



January 4, 2011

(Released Thursday, Jan. 6, 2011)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	13.55	86.45	86.68	26.30	13.04	0.00
Last Week (12/29/10)	7.69	92.11	89.43	37.46	9.99	0.00
3 Months Ago (10/03/10)	75.69	24.49	2.42	1.01	0.02	0.00
Start of Calendar Year (1/1/11)	13.55	86.45	86.68	26.30	13.04	0.00
Start of Water Year (10/01/10)	75.57	24.43	2.42	0.99	0.00	0.00
One Year Ago (1/04/10)	72.99	27.10	0.99	2.31	0.00	0.00

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

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NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

- Meeting long-term needs for water under drought-of-record conditions
 - Regional & State Water Plans
 - Drought response, existing water supplies and needs, future water demands, water management strategies- and conservation efforts, & financing needs
 - Public input incorporated alongside multiple other stakeholder groups
- Local response to drought when it occurs
 - Drought Contingency Plans
- How state agencies respond to drought

Flood Planning

- Texas relies on Federal Emergency Management Agency (FEMA) maps
 - National Flood Insurance Program
- Texas ranks highly in flood risk disclosure
- Texas Flood Infrastructure Fund, regional & state flood planning
 - Response to Harvey
 - 15 regional groups
- Access to flood risk information, flood insurance, and flood mitigation and disaster recovery funds is often highly inequitable



Flooding from Hurricane Harvey in Houston



Climate Adaptation Planning

- No statewide plan
- Multiple local plans
 - E.g., Houston Climate Action Plan & Resilient Houston, Harris County Climate Action Plan for Internal Operations
 - Austin, San Antonio, Dallas, El Paso
- Multiple climate equity advisory committees

Houston and Harris County are among Texas communities engaged in climate adaptation planning

Uncertainty of Transboundary Waters

- 1944 water treaty with Mexico
 - Must deliver 350,000 AF of surface water annually on a five-year cycle
 - Allows for water debt during drought
 - Mexico unable to reach debt 3 times since 1992
- Climate change – supplies unreliable
- Unsustainable agricultural and industrial water practices
- Limited efforts on adapting & managing



Rio Grande in Big Bend National Park

Wikimedia Commons



Challenges & Opportunities



Green roof at The Museum of Fine Arts, Houston

Nature-Based Infrastructure

- Practices that conserve & mimic natural processes to help communities better bounce back from extreme events
 - E.g., rain gardens, constructed wetlands, bioswales, beach & coastal dune restoration
- Can reduce urban heat & flood impact, improves water & air quality
- Currently often more common in more affluent areas

One Water

- Philosophy that all water has value and should be managed sustainably and inclusively
 - Stormwater, wastewater, drinking water, surface water, groundwater, sea water, etc.
- Account for water quantity & quality
- Unified planning for long-term resilience
- Emphasis on engagement, incorporating all voices in planning
- Austin & New Braunfels

Recommendations

Equity in spending government funds at the local, regional, state, and federal level

e.g, Justice40 in IIJA & IRA funding, Harris Thrives, etc.

Incorporating community voice in planning, co-designing solutions

Increasing public engagement with earlier involvement, accessible options &/or incentives, facilitators, transparency

Incorporating lived & practitioner experience

Identifying & dismantling causes of inequities

E.g., causes of legacy pollution, monitoring sewage overflows & drainage disparities, community research

Barriers to improved technology, policy, remediation, etc.

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