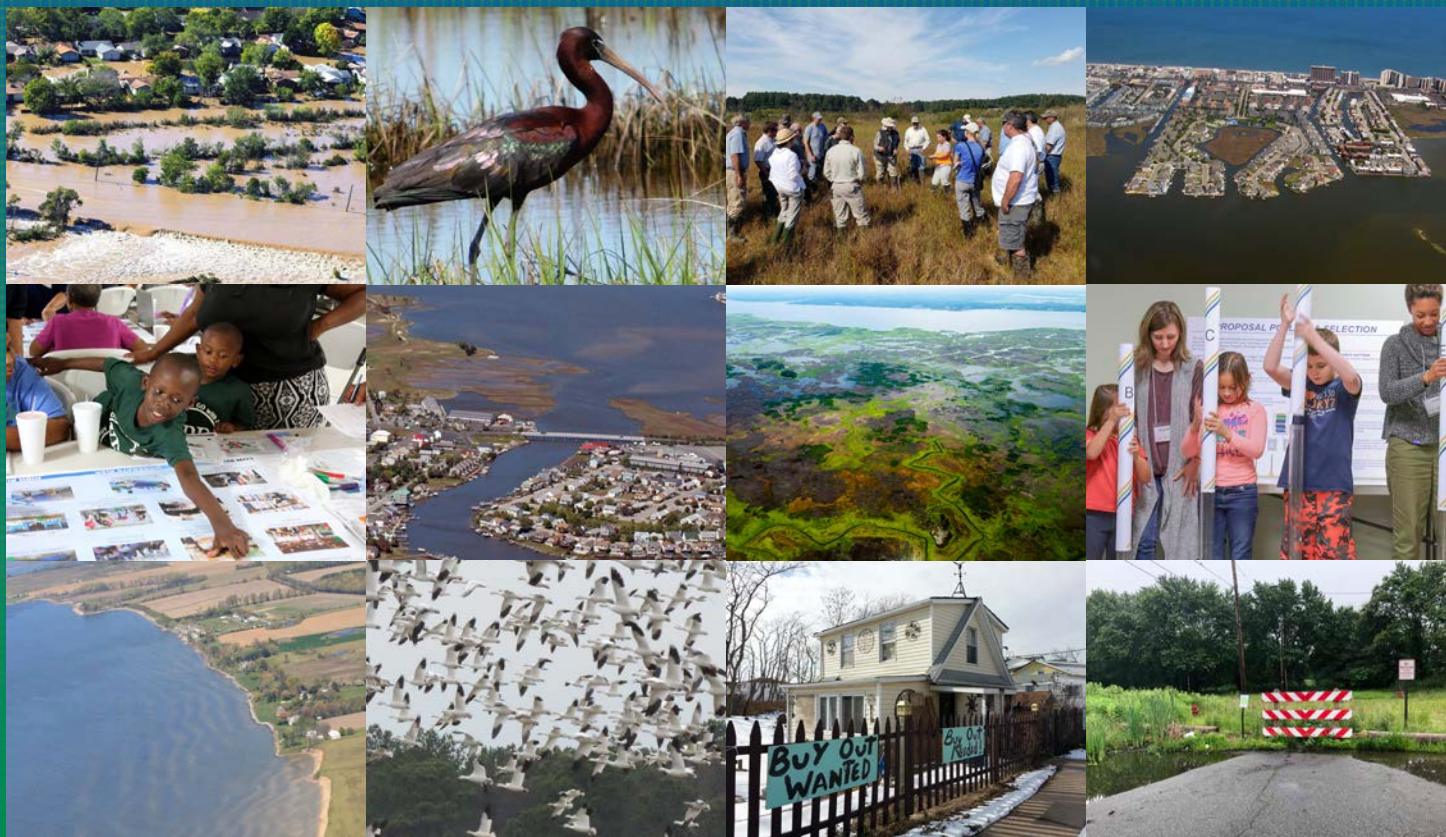


# Managing the Retreat from Rising Seas

## Harris County, Texas: Flood Control District Local Buyout Program



GEORGETOWN CLIMATE CENTER



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# Managing the Retreat from Rising Seas: Lessons and Tools from 17 Case Studies

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## About This Report

As seas continue to rise and disaster events and extreme weather increase in frequency and intensity, climate change is driving state and local policymakers to evaluate strategies to adapt to various risks affecting many communities. In addition to protection (e.g., hard shoreline armoring) and accommodation (e.g., elevating or flood-proofing structures) measures, coastal governments and communities are increasingly evaluating managed retreat, where appropriate, as a potential component of their comprehensive adaptation strategies. Managed retreat is the coordinated process of voluntarily and equitably relocating people, structures, and infrastructure away from vulnerable coastal areas in response to episodic or chronic threats to facilitate the transition of individual people, communities, and ecosystems (both species and habitats) inland.

The aim of managed retreat is to proactively move people, structures, and infrastructure out of harm's way before disasters occur to maximize benefits and minimize costs for communities and ecosystems. For example, policymakers may maximize opportunities for flood and risk reduction by conserving wetlands and protecting habitat migration corridors and minimize the social, psychological, and economic costs of relocation by making investments in safer, affordable housing within existing communities.

This report is composed of 17 individual case studies. Each one tells a different story about how states, local governments, and communities across the country are approaching questions about managed retreat. Together, the case studies highlight how different types of legal and policy tools are being considered and implemented across a range of jurisdictions — from urban, suburban, and rural to riverine and coastal — to help support new and ongoing discussions on the subject. These case studies are intended to provide transferable lessons and potential management practices for coastal state and local policymakers evaluating managed retreat as one part of a strategy to adapt to climate change on the coast.

Collectively, these case studies present a suite, although not an exhaustive list, of legal and policy tools that can be used to facilitate managed retreat efforts. Legal and policy tools featured include: planning; hazard mitigation buyouts and open space acquisitions, as well as other acquisition tools like land swaps and reversionary interests; land use and zoning; and Transfer of Development Rights programs. The case studies also highlight various policy tradeoffs and procedural considerations necessitated by retreat decisions. Each jurisdiction is confronting different challenges and opportunities and has different, perhaps even competing, objectives for retreat. In addition, stakeholders in each of these cases are attempting to balance multiple considerations, including:

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protecting coastal ecosystems and the environment; fostering community engagement and equity; preparing “receiving communities” or areas where people may voluntarily choose to relocate; and assessing public and private funding options and availability. The case studies included in this report were selected to reflect the interdisciplinary and complex nature of retreat decisions and underscore the need for comprehensive solutions and decisionmaking processes to address these challenging considerations.

Where possible, all of the case studies share a consistent organizational format to allow easier cross-comparison of strategies, processes, and takeaways:

- The **Background** section introduces state or local context for each case study, including the risks and hazards facing each jurisdiction and its road to considering or implementing managed retreat strategies.
- The **Managed Retreat Examples** section focuses on the legal and policy tools that have been designed and implemented to support managed retreat strategies on the ground.
- The **Environment** section highlights how floodplains and coastal ecosystems have been restored, conserved, and protected as a part of comprehensive managed retreat strategies to provide ecosystem and community benefits, like reducing flood risk and creating community assets such as parks and trails.
- The **Community Engagement** section summarizes how affected residents have been contributing to planning and decisionmaking processes for climate adaptation and managed retreat.
- The **Funding** section identifies how the programs, plans, and projects discussed have been funded by federal, state, and local government and private sources.

- The **Next Steps** section captures the anticipated future actions that jurisdictions may take in implementing these managed retreat strategies.
- The **Considerations and Lessons Learned** section concludes with the primary takeaways from each example that other coastal state and local policymakers and communities may consider when developing or implementing their own managed retreat strategies using these legal and policy tools.

The case studies in this report were informed by policymakers, practitioners, and community members leading, engaging in, or participating in the work presented in this report. No statements or opinions, however, should be attributed to any individual or organization included in the *Acknowledgements* section of this report. It is also important to note that the programs and planning processes described in each case study are ongoing and the content included in this report is current as of early 2020. Future updates about these case studies will be captured in Georgetown Climate Center’s online resources on managed retreat.

These case studies were written to support Georgetown Climate Center’s Managed Retreat Toolkit, which also includes additional case study examples and a deeper exploration of specific legal and policy tools for use by state and local decisionmakers, climate adaptation practitioners, and planners. For future updates about these and other case studies and the Managed Retreat Toolkit, please visit the **Managed Retreat Toolkit** and the **Adaptation Clearinghouse**.

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# Harris County, Texas: Flood Control District Local Buyout Program

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## Executive Summary

Harris County, Texas, established a voluntary home buyout program through the regional government agency, the Harris County Flood Control District (HCFCD), that can serve as an example for other local jurisdictions considering retreat from coastal and riverine flood-prone areas. As a result of the program, more than 3,000 properties (as of 2019) have been purchased to remove residents from flood-prone areas and prevent future flood damage to people, property, and the environment. The buyout program is focused on risk reduction and flood mitigation best practices, where once bought out, properties are returned to open space uses to restore their natural beneficial flood retention functions. HCFCD has developed an effective communication and outreach strategy to educate the public and encourage program participation. Historically, properties have been acquired with grants from the Federal Emergency Management Agency's Hazard Mitigation Assistance program, Department of Housing and Urban Development's Community Development Block Grant program, and local funding from a dedicated ad valorem property tax (i.e., a tax based on a property's assessed value). Other state, regional, and local jurisdictions considering managed retreat could implement a similar buyout model that operates in both a pre- and post-disaster context and engages the community throughout the entire process.

## Background

Harris County, Texas — which includes the City of Houston — is located in the southeastern part of the state near Galveston Bay. Both the county and Houston have been experiencing population growth and, at the time of the 2010 U.S. Census, Harris County was the third highest populated county in the United States. In 1985, the Harris County Flood Control District (HCFCD), a regional government agency, established a voluntary home buyout program. As a result of the program, more than 3,000 properties (as of 2019) have been purchased and restored to relocate residents from flood-prone areas and prevent future flood damage to people, property, and the environment.

## Managed Retreat Examples

### Buyout Program

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HCFCD has developed a comprehensive approach to buying out homes in the county for the purpose of reducing local and regional flood risks. The home buyout project timeline typically occurs over an eight- to 12-month period, but may take up to two years from a flood event (if a buyout is occurring post-flood):

1. Property owners volunteer
2. Eligible properties are identified
3. HCFCD secures funding
4. Property is appraised (based on [pre-disaster/ flood] fair market value)
5. Agreement for sale and relocation benefits determined
6. Closing and move-in to new home

The buyout program is designed to prevent future flood damages where structural projects to reduce flooding are not cost effective or beneficial. Single-family homes, multi-family residences, commercial buildings, and churches are all eligible; however, residential structures are assigned a higher priority.

Participation is strictly voluntary and acquisitions under the buyout program are heavily influenced by the availability of federal funds. To effectively allocate buyout funding, the program uses “ideal buyout criteria,” prioritizing homes to be bought out in relation to their depth in the floodplain and risk of flooding. To be eligible, properties must meet at least two of the following three criteria to identify whether they are:

- Located at least two-feet deep within the 100-year floodplain (i.e., two feet of depth during a 100-year rain event);
- Located in flood way; or
- Located in a 10-year floodplain.

Additionally, buyouts will typically only occur if individual properties are a minimum of five acres in size; or if ten contiguous properties of any size can be acquired at once. This allows properties to be successfully converted to another use, reduces maintenance costs, and avoids checkerboarding within buyout areas. HCFCD also assesses if a property acquisition is cost effective by evaluating buyouts based on engineering studies and benefit-cost analyses to show that the cost of acquiring a property and demolishing structures is less than the estimated costs from a future flood.

## Environment

Once properties are acquired by HCFCD, structures are demolished, and properties are restored to natural and beneficial ecosystem functions including to widen bayous, create recreational green spaces, and enhance stormwater



drainage. Restoration and construction activities may require that HCFCD seek approval from relevant federal agencies to ensure that a project's design is consistent with current funding and permitting laws and policies. As of 2019, more than 1,000 acres of bought-out land have been cleared and restored or are in the process of being restored.<sup>1</sup> One unique feature of the Harris County program is that, since 2015, HCFCD has utilized Geographic Information Systems (GIS) analysis to validate the success of buyouts, tracking the number of homes that would have flooded had they not been acquired. HCFCD would like to expand the use of GIS and map every buyout and flood event from 1985.

## Community Engagement

The HCFCD buyout program has a robust education and outreach program and community engagement strategy. HCFCD has established a strong online presence with a user-friendly website offering detailed information about the voluntary buyout process. The website includes testimonials from previous program participants,<sup>2</sup> infographics, and easy-to-follow videos specific to Harris County covering both general program information and the actual buyout process.<sup>3</sup> The availability of these resources allows people to become familiar with buyouts and weigh the advantages and disadvantages of volunteering their properties for the program. HCFCD supplements its online resources with targeted mail campaigns and in-person resources, such as door-to-door visits and community meetings in high flood risk priority areas. This dual communications approach has given the buyout program traction during non-disaster periods and allows HCFCD to actively disseminate accurate information, avoid misconceptions about buyouts, and incentivize participation.

## Funding

Between 1985 and 2017, HCFCD has spent \$342 million to purchase properties; however, more than 100,000 residential properties still remain in the 100-year floodplain.<sup>4</sup> HCFCD primarily utilizes three sources of funding for its buyout program: (1) federal funding from the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance program;<sup>5</sup> (2) federal funding from the Department of Housing and Urban Development Community Development Block Grant–Disaster Recovery program;<sup>6</sup> and (3) local funding through property taxes. On average, the Harris County Commissioners Court allocates \$60 million to HCFCD in annual capital improvement project funds through a dedicated ad valorem property tax.<sup>7</sup> In 2019, the tax rate was 2.877 cents per \$100 of the property valuation.<sup>8</sup> A portion of these funds is used annually to cover the local match for federal grants.

## Next Steps

In 2017, Hurricane Harvey hit Harris County and caused considerable flood damage. All of Harris County's 4.7 million residents were either directly or indirectly affected. HCFCD received approval from the Texas Division of Emergency Management — utilizing FEMA's Hazard Mitigation Grant Program — to initiate a home buyout response to Hurricane Harvey. Texas Division of Emergency Management initially approved at least 965 homes at a federal cost share (75 percent) of over \$159 million from FEMA.

On August 25, 2018, Harris County residents approved a ten-year, \$2.5-billion bond for HCFCD to implement over 200 flood risk reduction studies and projects, including buyouts, across the county, in partnership with different federal agencies.<sup>9</sup> As of 2019, approximately 146 of these projects are active in stages ranging from feasibility assessment to construction.<sup>10</sup> The bond is notable because it increased HCFCD's local funding stream for capital projects that was historically limited to \$60 million per year.

## Considerations and Lessons Learned

Harris County's flood buyout program is a notable model due to its comprehensive approach that other regional and local jurisdictions can evaluate as a part of riverine and coastal retreat strategies. HCFCD utilizes consistent buyout criteria to prioritize projects and maximize flood reduction benefits on a larger scale by identifying properties or collections of properties that are a minimum of 5-10 acres in size. Moreover, HCFCD's work to restore bought-out properties and quantify the benefits of the program through GIS could be replicated by other jurisdictions to demonstrate the return on investment for buyouts, which could be used to generate political and community-level support for this acquisition tool. In addition, HCFCD's dual in-person and online efforts to engage communities enable HCFCD to maintain a presence in the region throughout disaster and non-disaster periods to increase awareness and potential participation in the program. Regardless, as Harris County increasingly faces potential impacts from disaster events, such as recovering from Hurricane Harvey in 2017 and Tropical Storm Imelda in 2019, additional opportunities for local revenue sources could help supplement federal funding to expand the program and get more people out of harm's way on a consistent basis.



## Endnotes

- 1 HARRIS CNTY FLOOD CONTROL DIST., 2019 FEDERAL BRIEFING: FOLLOWING THROUGH (2019), <https://www.hcfcd.org/media/3570/hcfcdfederalbriefing2019.pdf>.
- 2 *Benefits and Accomplishments*, HARRIS CNTY FLOOD CONTROL DIST., <https://www.hcfcd.org/hurricane-harvey/home-buyout-program/benefits-accomplishments/> (last updated Aug. 28, 2019).
- 3 *Video: Home Buyout Program*, HARRIS CNTY FLOOD CONTROL DIST., <https://www.hcfcd.org/hurricane-harvey/home-buyout-program/videos-home-buyout-program/> (last updated Dec. 18, 2018).
- 4 *Lisa Song, Al Shaw, & Neena Satija, After Harvey, Buyouts Won't be the Answer for Frequent Flood Victims in Texas*, TEX. TRIBUNE (Nov. 2, 2017), <https://www.adaptationclearinghouse.org/resources/fema-hazard-mitigation-grant-program.html>.
- 5 *Georgetown Climate Ctr., FEMA Hazard Mitigation Grant Program*, ADAPTATION CLEARINGHOUSE, <https://www.adaptationclearinghouse.org/resources/fema-hazard-mitigation-grant-program.html> (last visited Nov. 11, 2019).
- 6 *Georgetown Climate Ctr., HUD Community Development Block Grant–Disaster Recovery*, ADAPTATION CLEARINGHOUSE, <https://www.adaptationclearinghouse.org/resources/hud-community-development-block-grant-disaster-recovery.html> (last visited Nov. 11, 2019).
- 7 HARRIS CNTY FLOOD CONTROL DIST., 2019 FEDERAL BRIEFING: FOLLOWING THROUGH (2019), <https://www.hcfcd.org/media/3570/hcfcdfederalbriefing2019.pdf>.
- 8 *Id.*
- 9 *Id.*
- 10 *Id.*

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