



CITY OF HOUSTON

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FLOOD HAZARD AWARENESS

Even though you may not live in a defined floodplain, you may still be at risk of flooding in any given area of Houston. Now that hurricane season is upon us, it is the perfect time to make sure you are knowledgeable on how to protect yourself and your property for the next major storm.

Houston's local flood hazard

Houston is unique in that its flat terrain, large amount of urban impervious cover (concrete), slowly-absorbing soil, and potential for thunderstorms, tropical storms, and hurricanes all combine to form ideal conditions for flooding. Due to its humid-subtropical climate and proximity to the coast, Houston is susceptible to large amounts of rainfall that are often too great for its infrastructure and bayous to handle. Once the City's ditch and storm sewer networks are inundated with storm water runoff, streets become the secondary drainage facilities. The city's streets and thoroughfares are drained by the following watershed systems: Armand, Brays, Buffalo, Greens, Hunting, Luce, Sims, and White Oak Bayous; Clear, Cypress, and Spring Creeks; Addicks and Barker Reservoirs; and the San Jacinto River.

Floodplains and their functions

A floodplain is the normally dry area, usually low land, adjacent to a stream, river, lake, watercourse, or bayou that is inundated on a periodic basis with flood waters. Floodplains are natural features that serve to detain the stormwater from invading urbanized areas due to overwhelmed drainage systems. According to the Harris County Flood Control District (HCFCD), there are four kinds of flooding that affect this area (graphically represented at www.hcfcd.org/F_fpexplained.html):

- Valley floodplain – Flooding can be deep because of the creek valleys in the area that is northwest of the city limits. The flooding typically lasts a few days due to the “defined” ground in the area.
- Major river floodplain – As listed above, there is only the San Jacinto River that is near the boundaries of the city, located to the northeast. Flooding near the San Jacinto River usually lasts a week or more due to the large and deep floodplain surrounding the river.
- Coastal floodplain – Floodplain areas next to the coast are susceptible to coastal flooding due to unusually high tides or surges from hurricanes and tropical storms. Houston city limits extend into the coastal reaches via I-45 south into Clear Lake.
- Shallow floodplain – The kind of flooding that occurs in shallow floodplains is not specific to any watershed; rather, it is an issue of channels and drainage systems anywhere around the city that exceed their limits during a rain event. All of Houston is at risk for shallow flooding. The flooding usually lasts hours, not days, and is comparable to the type of flooding that results from overland flow and ponding.

For more specific information regarding the proximity of your structure to floodplain areas, please consult the effective Federal Insurance Rate Maps (FIRMs). FIRMs are located at all city libraries and the Floodplain Management Office (FMO). Maps from the Tropical Storm Allison Recovery Project (TSARP) became effective on June 18, 2007, and maps that were current before that date are no longer used by the City. Old maps can be viewed by visiting FEMA at www.fema.gov/plan/prevent/fhm/index.shtm. Call 713-535-7666 or visit the City of Houston FMO at 3300 Main to consult a City staff member who can help determine your property's flood zone, base flood elevation, and other floodplain and map-related information. The FMO maintains all FIRMs, historical FIRM panels (maps that are no longer “effective”), map amendments and revisions, flood insurance studies, and elevation certificates. City personnel are available to answer all of your floodplain management-related questions.

A history of flooding

Houston has experienced flooding since its founding. Storm events as far back as 1913 and 1929 produced intense rain that led to many of the city's bayous overflowing their banks. Among the many flood events recorded for the city is Tropical Storm Allison in 2001, which went on record as being one of the most devastating rain events in US history. In the span of about five days, TS Allison produced as much as 38 inches of rain, and is ranked as one of the costliest tropical storms in US history with damages exceeding \$5 billion. Since TS Allison, the City has been affected by other disaster events such as Hurricanes Katrina and Rita that left their share of rain in and around the Houston area. In an attempt to preserve the natural and beneficial functions of the floodplain while also protecting the city's residents, the City regulates development within the 100-year floodplain.

Floodplain development and substantial improvement/damage requirements

All development within the floodplain is required to obtain a development permit by City ordinance. Development includes, but is not limited to, all new construction, filling, grading, and paving. In addition to a development permit, Elevation Certificates (EC) may be required. An EC is an official document that provides specific elevation and flood zone information for structures located in the 100-year floodplain, and must be prepared, signed, and sealed by a registered professional engineer or surveyor licensed in the state of Texas. ECs and development permits are kept on file and are available at the FMO at 3300 Main. Contact the FMO

before you decide to build or fill so that the appropriate regulations are followed. Substantially damaged or improved structures, where the cost of rehabilitation or improvements to a building equals or exceeds 50% of the building market value, also require special permits and documents, and are held to the same standards as new construction. One basic standard the City adheres to is the requirement of new construction and substantially improved structures to be built 12 inches above the base flood elevation. This required freeboard helps the City protect its structures from flooding, but does not eliminate the flooding risk. More information on development and building standards under the City's Code of Ordinances may be referenced at the following link: www.swmp.org/floodplains/dordinances.htm. Contact the City Helpline at 3-1-1 from a touchtone telephone to report any illegal development or other violations such as unauthorized filling in the floodplain.

The importance of flood insurance

Even though your property is not located in the floodplain, it is still possible that your property may incur damage caused by flooding. In the life of a 30-year mortgage, there is a 26% chance of experiencing a flood if a property is located in the floodplain; however, during TS Allison, 80% of the damage caused by flooding occurred *outside* of the floodplain. The conclusion to draw is that flood insurance is advisable for anyone living or working in Houston. Standard property insurance does not cover flood damage; however, there is flood insurance backed by the National Flood Insurance Program (NFIP) that is available to all residents in participating communities, even if the structure has received flood damage in the past. Flood insurance can be purchased from the NFIP and, because Houston participates in the Community Rating System (CRS) program, flood insurance premiums may be offered at a discount to residents both in and out of the floodplain. Keep in mind that there is a 30-day waiting period before your flood insurance policy takes effect. Call 1-800-427-2419 or visit www.floodsmart.gov for more information.

Property protection

In the event of a flood warning, and if time is sufficient, relocate your furniture and belongings to a higher elevation in your home. Place important documents in a dry location and preserve as much drinking water and non-perishable food as possible. To protect your property from future floods, other forms of protection can come in the form of permanent retrofitting of your structure such as elevation of your foundation, or wet or dry floodproofing your basement. Because of Houston's susceptibility to hurricanes and other gulf storms, measures that protect against high winds, such as storm shutters or reinforced garage doors, should be considered. Elevation of your home may protect it from flooding if it is already at risk. Information about these and other property protection measures is available at all public libraries throughout the City of Houston. You can also call 713-535-7666 to ask for assistance from a City staff member who can provide additional advice on floodproofing, retrofitting, and other methods of solving your flooding problems.

Drainage system maintenance – Helping to reduce flooding in the city

Although the City has a storm sewer and drainage maintenance program, it is impossible to keep all drainage systems clear at all times. As a citizen, you can assist by keeping the banks of ditches, streams, and bayous clear of brush and debris, and not allowing grass clippings, oil, or other contaminants in storm sewer inlets. Dumping of debris into ditches, streams, or bayous is a major cause of local drainage problems, and is a violation of the Houston Code of Ordinances Section 28-1. To report a violation or a maintenance problem, please call the City's Service Helpline by dialing 3-1-1. Visit the City of Houston Storm Water Management Program at www.swmp.org to see what improvements are developing and how you can report flooding in your area.

How to protect yourself and your family during a flood

Once a flood occurs, there may still be time to protect you and your loved ones. The following are some helpful hints to remember:

- Take your family and yourself to a safe location, preferably higher ground. Don't forget your pets – they depend on you too.
- Do not use electrical appliances that may have become wet. Stay away from power lines and electrical wires.
- Do not walk through flowing or stagnant flood water. Children are often tempted to play in flood water; however, it only takes six inches of quickly moving water to knock someone over. Flood water is also a prime carrier for germs and sickness that threaten public health and safety.
- Do not attempt to drive through a flooded area. The majority of vehicle-related deaths are caused by drivers trying to cross flooded streets. Ten inches of water on the roadway where water is flowing rapidly will carry away most cars and small trucks.

Houston's flood warning systems

Listen for information from the City's Office of Emergency Management (OEM) or by tuning to local radio and TV stations. Also, be aware of the Emergency Alert System (EAS) and familiarize yourself with the different warning signals. Important warning information may be obtained directly by calling 713-884-4500 or visiting www.houstonoem.org. NOAA Weather Radio broadcasts current local weather information, watches, warnings, and forecasts 24 hours a day, and can be monitored on 162.400 mhz. Other warning or alert systems include Houston Municipal Channel spots provided by the OEM, Highway Advisory Radio systems, and Texas Department of Transportation freeway message signs. Emergency vehicle public announcements or door-to-door notifications may be used for future storm events. With so many resources and information available to you, protecting yourself, your family, and your property is not only good thinking; it's practical.