



LUCHA

LAND USE COLONIA
HOUSING ACTION

AN INITIATIVE OF LUPE AND ARISE

Educational Library

Governance

Housing

Drainage | Level 1 | How Water Works

Public Services

Planning



Water Is About More Than Flooding



Understanding drainage and flooding begins with understanding water, and how it works in your community.

Issues of water are all connected, and are affected by both nature and humans.



Why does flooding occur?



Where does our drinking water come from?



How can we protect water quality?



How can we manage drought?

Understanding how water works, how we benefit from it, and how we can build with it, and not against it, will help make our communities stronger.



Why is understanding water important to me?

- ▶ How we build our communities can have a significant impact on how water drains, increase or change where flooding occurs, increase demand for drinking water, impact the quality of water for communities downstream (pollution), and a variety of other concerns.
- ▶ Water is essential to life, all plants and animals must have water to survive. It refills our rivers and underground and surface reservoirs; it is important for drinking water, agriculture and other uses.
- ▶ Water is a renewable resource as we describe on page 4 in the water cycle; however, it can be depleted locally. Unlike some other resources, water has a natural way of distributing itself across the earth. The water cycle returns water considered unusable, salt water, to us in the form of fresh water. It also helps to clean water we have contaminated.
- ▶ Water can pick up pollution as it drains from our yards, streets, and parking lots into our rivers, reservoirs and reservoirs. This affects the quality of water that we drink, use to cook, and bathe, as well as the health of our waterways downstream.
- ▶ The water we use every day comes from a combination of surface water and underground water (groundwater) sources. Surface water includes rivers, lakes, and reservoirs. Groundwater lies under the surface of the land, where it travels through and fills openings in the soil and rocks found below us.
- ▶ Understanding how water moves and interacts with an area helps us understand why certain areas flood, why others areas are dry, where our drinking water comes from, and how our infrastructure and development affects the natural flow of water in our area.



History Of Valley Flooding

Flooding has always been a part of the Rio Grande Valley

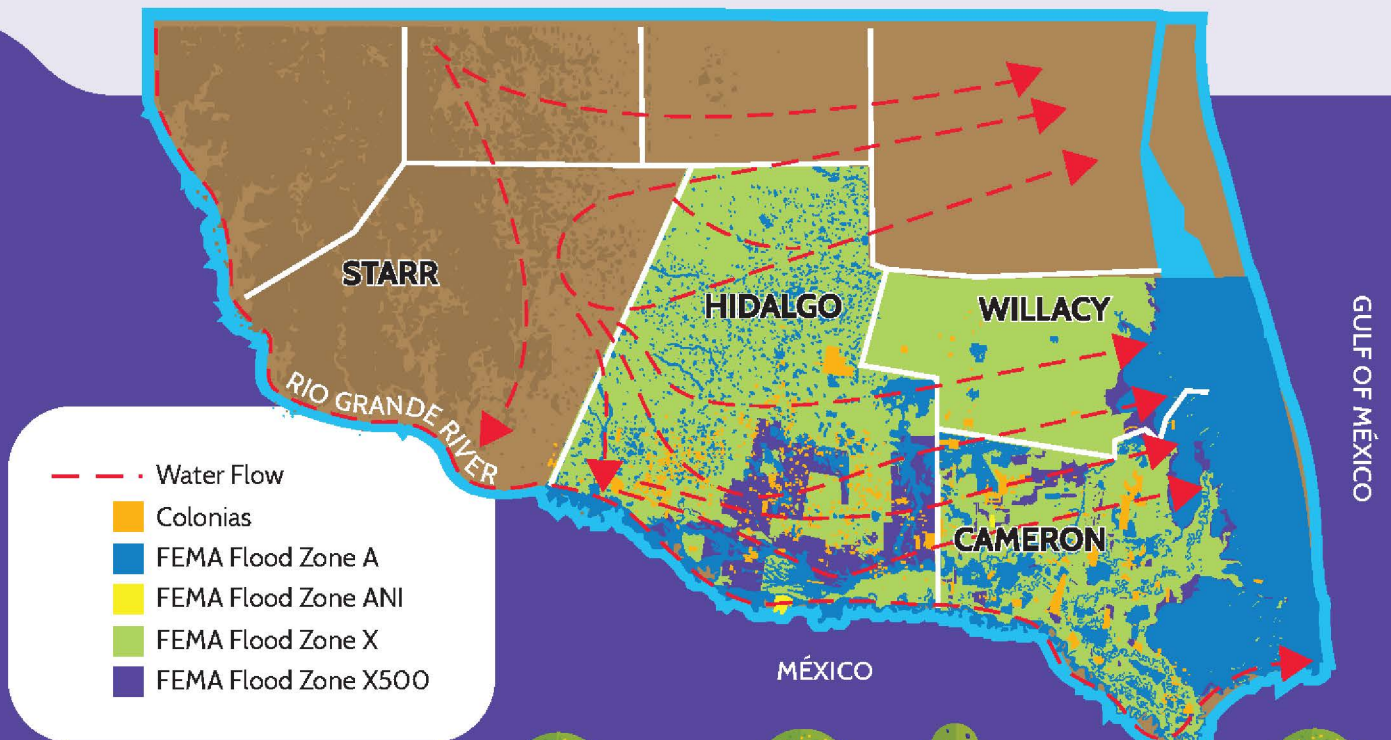
The land we live on, play on, work on, grow food on, and see all around us would not be here without this flooding process. In other words, the flooding of the Rio Grande River formed this delta of land we live on. Until recently, the Rio Grande river would regularly overflow its banks and cover substantial portions of the area of land we now call the Rio Grande Valley. The seasonal floods spread rich nutrients across the land; leaving the Valley with rich soil, ideal for agricultural production.

Infrastructure to control the movement of water began to be built in the early 1900s for irrigation. Large scale engineered irrigation systems were built to provide water for crops. These systems included irrigation canals, pump stations, standpipes, and irrigation reservoirs found throughout Hidalgo and Cameron County.

As the region's population grew in the mid 1900, concerns over flooding and property damage led to the first drainage and flood protection systems. Much of the region's drainage infrastructure was concentrated in the cities, and much of the irrigation infrastructure was found in the outlying farmland across the Valley.

This has created challenges for new communities built on former farmland, which are primarily served by infrastructure not designed to manage the amount of water resulting from the new use of land. As the population continues to grow, [more people = more need for drainage infrastructure], so do the concerns over the amount of water, or capacity, the current system can handle.

Flood Map Of The Rio Grande Valley



How Does Water work?



The water on the Earth is in a continual cycle of movement called the water cycle. The water cycle begins in our largest bodies of water, our oceans.

Water in the oceans is heated by the sun, and causes water to evaporate.



Rising air takes vapor into the atmosphere, along with water evaporated from plants, the soil, rivers, and other sources.



The vapor rises into the atmosphere where it collects to form clouds, wind currents then push those clouds to new locations.

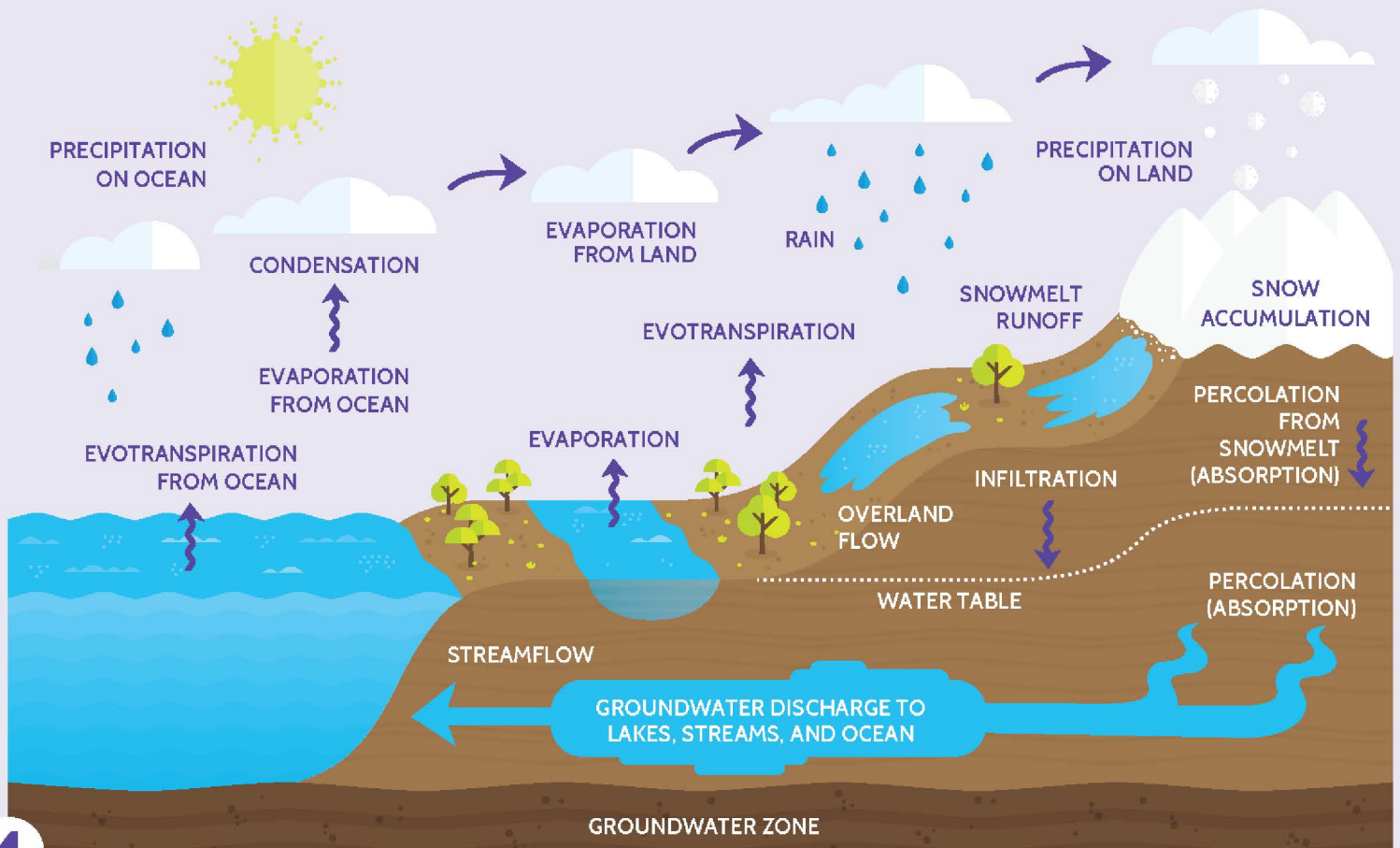


When rain hits land it can be absorbed by soil replenishing our ground water, be used by plants and animals, or flow over the land into rivers, resacas, creeks, ponds, lakes, and oceans. Then the cycle starts again.



Clouds bring rain, snow, and ice (precipitation), returning the water to land, oceans, and other bodies of water.

Natural Water Cycle



How Does Water Work In The Lower Rio Grande Valley?

Valley Flooding

The Valley, like most coastal and near-coastal areas, is prone to flooding from time to time. The land in the Rio Grande Valley is characterized by mostly flat terrain resulting from the fact this area is an ancient delta of the Rio Grande river, this flat terrain is one of the reasons the area is prone to flooding.

In the past, before flood controls like levees, canals and other infrastructure were created, this flat surface allowed floodwaters to pond and flood low lying areas. Also, like all deltas, the land here is a mix of sand, silt and clay, but we have more clay than most. Clay soils do not “soak up” or allow much water to be absorbed by the ground, and as a result, water takes a long time to infiltrate or pass down into the ground.

This is another reason flooding is a problem in the RGV. Other reasons include the fact that we have significant amounts of urban development, with many cities growing very rapidly and sometimes not planning as effectively as possible.

There are two natural streams that take water to the east, the Rio Grande and the Arroyo Colorado. The Rio Grande flows to south of the RGV directly to the Gulf of Mexico. The Arroyo Colorado carries water to the Lower Laguna Madre. Only the western parts of Hidalgo County drain towards the Rio Grande, the rest drain towards the Arroyo Colorado, and major floodways developed to control flooding.

Another water feature we commonly see around the valley, but mostly in the Cameron County area, are resacas. Resacas are ancient, now disconnected portions of the Rio Grande river that were formed when the river flowed unchecked and uncontrolled for thousands of years.

Prior to the development of the many dams, man-made levees, and other flood protection systems that now protect the RGV from truly massive, large-scale river-based flooding, the river would flow out of its banks on a near seasonal basis. Today resacas not only serve as attractive public spaces, they also provide a place for stormwater to go, reducing the flooding concerns of the area.

The Water Cycle In The Rio Grande Valley



If We Have Drainage Infrastructure, Why Does My Neighborhood Or Parts Of The Valley Flood?



First, we must all remember that the valley is very flat. The flat land makes it necessary to build big drainage ditches. This means we must make them both very wide and deep.



The neighborhood may be built in a floodplain, which puts it at a significantly greater risk of flooding. It may also take longer for water to drain from the area.



Elevated irrigation and drainage canals, roadways, buildings and railroad embankments can and often prevent water from reaching drainage channels. This can also happen when debris from trees, leaves, trash, etc. found on roadways and yards flows to and clogs up a storm drain inlet.



Also, some people fill existing ditches with trash or soil to gain more land. This blocks water from moving from one point to another and again, the water backs up.



Neighborhood drainage ditches may not be connected to regional drains, which means if the neighborhood's internal infrastructure, which is most commonly a system of small drainage ditches, cannot hold all of the water during a heavy rain the neighborhood will be at greater risk of flooding.

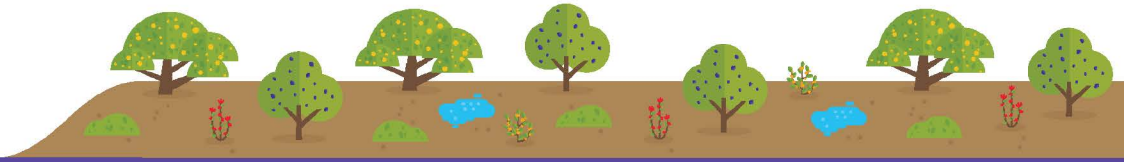


Groundwater (water under the ground) is very close to the surface in many areas of the Valley. This means drainage ditches are dug too deep they will fill with water. As a result, ditches are made too small. This can cause water in the channels to back up and cause flooding - particularly in rapidly growing areas where drainage needs are increasing.



New development increases the demand on drainage infrastructure. If the existing infrastructure can't handle the additional water, or if it's not upgraded with increased capacity, surrounding areas may begin to flood.

Example Story - Flooding Event In Edinburg, TX On June 2015



Understanding how development affects water can often be hard to see. One neighborhood in Edinburg was able to see the impact of a new development, and the barriers that infrastructure, like a road, can create after a particularly large rain storm.

A new commercial development and housing development was built along Alamo Road, on the opposite side of the street from a major storm drain with no connection to the drain. After the large rain, stormwater was unable to cross over the road to get to the drain, and resulted in significant flooding for the existing neighborhood.



At first County public workers tried pumping the water out, but ultimately the more effective strategy was cutting a trench through Alamo Rd - giving the water direct access to the storm drain on the other side. The combination of increased development, changing the way water moves, and the barrier of the roadway caused what is often referred to as localized flooding.

Localized flooding is caused by the drainage system in a particular area being overwhelmed, causing water to pool and even flood streets, yards, and even lower floors of homes and businesses.



The LUCHA Library

The Land Use Colonia Housing Action [LUCHA] initiative is a partnership of organizations and organized colonia residents to build leadership capacity, expand technical knowledge, change land use and development policy, and build relationships between colonia residents and local, state and federal authorities. The goal of the LUCHA initiative is to build power by supporting community organizing efforts, inform colonia leaders on key issues, and provide opportunities for engaged conversations with regional experts.

The LUCHA Library is part of the larger LUCHA initiative. The Library is a collection of community education resources that seeks to provide Rio Grande Valley residents with easy to understand technical information around key community issues. Developed with the members of LUPE and ARISE, the LUCHA Library is designed to support community organizing efforts in the region by empowering residents with information.

