



The Lower Rio Grande Valley is proof that longitude and latitude are destiny.

Favored by a subtropical climate that extends the growing season annually to as many as 341 days and coaxed with irrigation, the land produces vegetables and citrus that is unmatched except in Florida and California. What nourishes—sugar cane, grain sorghum, corn and other vegetables—in some regions gives way to what clothes—cotton. Land that is not farmed or committed to urban life in part supports ranching enterprises. The Rio Grande itself, the second longest river within or bordering the United States, divides two nations. Nonetheless, its very existence has prompted a distinct confluence of cultures, histories, and languages, attracting tourism and building trade. It draws Europeans and Canadians as well as Americans to the region's warm winters, workers to its fields, and birds and wildlife to its water. Indeed, the region's prime product may be the promise of respite—relief from the poverty of Mexico's interior, reprieve from winter's chill, and rest on the migratory trail.





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Physical Environment

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O V E R V I E W

THE FOUR SOUTHERNMOST COUNTIES OF TEXAS—Cameron, Hidalgo, Starr, and Willacy—make up the Lower Rio Grande Valley. Like any coastal plain, the region is generally flat, but rich alluvial soils afforded by the Rio Grande make the land comparable to farming regions in Florida and California.

The subtropical climate fosters agriculture, but the trend toward urbanization, the most rapid in the state and one of the most rapid in the nation, is projected to change land use. The population of the McAllen-Edinburg-Mission metropolitan area, home to both rapid development and agriculture, grew 48.5% between 1990 and 2000, according to the U.S. Census Bureau.

Fruits and vegetables produced in the Lower Rio Grande Valley are part of a modern commer-

cial supply chain and are shipped out of the region, and few markets exist for local produce.

The Rio Grande supplies most of the region's water, and water shortages, caused by Mexico's preventing inflows from Mexican tributaries in recent years, have had a negative impact on agricultural irrigation. Despite these shortfalls, water supplies in U.S. possession have so far met municipal and industrial demands. More pressing, from a health standpoint, is water quality, which is jeopardized by sewage and chemical contamination that occurs as the river runs through rapidly urbanizing and industrializing regions. High fecal coliform levels represent a potential health hazard to recreational users of the river, and risks accrued from irrigation are under study. >>>

The extreme southerly location of the Texas Lower Rio Grande Valley has endowed the region with physical and environmental attributes that are unique in the United States. This chapter provides a brief physical description of the region.

GEOGRAPHY AND TOPOGRAPHY

The Lower Rio Grande Valley region comprises the four southernmost counties of Texas—Cameron, Hidalgo, Willacy, and Starr. The region is part of the Rio Grande river delta, stretching east-southeast for approximately 250 miles to the confluence with the Gulf of Mexico. This description belies a significant geopolitical fact that the Lower Rio Grande Valley is a border region between the United States and Mexico. The topography of the region is relatively flat, as typifies coastal and alluvial river plains. The regional soil types are predominately alluvial clays, clay loams, and sandy loams, which are extremely productive under cultivation.

CLIMATIC DESCRIPTION

The southerly and coastal geography of the Lower Rio Grande Valley exposes it to warm tropical air patterns off the Gulf of Mexico, resulting in a subtropical but semiarid climate. This pattern produces hot and humid summers, rainy periods during the August to October hurricane season, mild and dry winters, and typically a late spring period characterized by precipitation. The climate and geography allow for the risk of extreme drought periods as well as intense tropical rain events. Altogether, the range of annual precipitation is only 24 to 28 inches, while annual water evaporation rates can be twice as high during the summer (Lower Rio Grande Valley Development Council, 2002).

There are approximately 320 frost-free days per year. Average January low temperatures are in the 40s, while maximum July temperatures average in the mid- to upper 90s. From a biological standpoint, the climate promotes a diversity of wild and cultivated plant and animal life that exists nowhere else in Texas. The combination of a long growing season and supplemental irrigation allowed creation of a diverse commercial agricultural industry. As the region urbanizes (see below), the physical potential still remains

for development of local food production systems, presumably devised around home and community gardening of fresh produce.

LAND USE

The major land use of the region remains agricultural, although the trend toward urbanization is the most rapid in the state and one of the most rapid in the United States (Booth, 2000). Total cropland has been a little over one million acres during the 1990s, about 30% of which is irrigated cropland or orchards (U.S. Department of Agriculture, 1997). In view of the total land area for the region (Table 2.1), 30% to 35% of the land is classified as cropland. In 2001, the three most extensive crops in terms of planted acreage were corn (54,000 acres), cotton (257,000 acres), and grain sorghum (396,000 acres), all of which are exported from the region. Approximately 100,000 additional acres of irrigated land are currently devoted to vegetable, citrus, and sugar cane industries, the last two being perennial crops. However, much of the remaining vegetable and citrus land lies within the rapidly developing metropolitan area of McAllen-Edinburg-Mission.

It should be noted that the region's fruit and vegetable industries are part of a modern commercial supply chain, with most of the harvest being exported to food service and retail distribution centers (Hall, 2003). Currently, no significant or unique links exist between the region's agricultural production sector and the food its population consumes. Other than local fruit stands, the Lower Rio Grande Valley region has no organized farmer's markets and even fewer outlets for local produce than other major metropolitan areas of Texas. The Lower Rio Grande Valley is an urbanized, modern economy, and the region's consumers access available food supplies through the same retail and food service outlets that other urban Americans do.

According to the 2000 U.S. Census, the McAllen-Edinburg-Mission area was the fourth fastest growing metropolitan area in the United States at the turn of the 21st century, experiencing a 48.5% population increase between 1990 and 2000. In 2002, McAllen had a 4.1 percent population growth rate, while Brownsville's was 3.4% (Booth, 2003; Real Estate Center at Texas A&M University, 2002).



Palm trees dot a median on the south Texas coastal plain in the Lower Rio Grande Valley along U.S. Highway 83. This route extends across the four-county area and like a magnet draws people and, with them, urbanization.



The Lower Rio Grande Valley relies on the Rio Grande for almost all agricultural, municipal, and industrial uses of water. About 30% of the area's cropland—estimated to be one million acres during the 1990s—is irrigated.



Prickly pear, a native plant that grows densely, can be found across south and west Texas and into the Mexican states south of the Rio Grande. It has been used to stop erosion in other parts of the world. Some species produce yellow flowers that are two to three inches across.



Fruit stands—some longstanding with the operator's home in back, some out of truck beds, and some no more than stacked boxes under a tree—sell locally grown produce and inspire customer loyalty. The region has no organized farmers' markets and fewer outlets for local produce than other cities in the state.

The distribution of population growth and development is obviously clustered along the Brownsville-Mission corridor of U.S. Highway 83 and also in the corresponding major Mexican urban centers of Reynosa and Matamoros, adjacent to McAllen and Brownsville, respectively. The population clustering on the U.S. side is also evident in the regional population and housing unit densities for the Lower Rio

Grande Valley, which exceed the state average (Table 2.1). This pattern of clustered urbanization is projected to increase over the next fifty years.

The pattern of population growth adjacent to the Lower Rio Grande Valley metropolitan areas presents two contrasts. The Mexican sister cities are following the same pattern, as the estimated populations of Reynosa and



This Maytag maquiladora was recently built in Reynosa, Mexico. (Photo courtesy of Chad Broughton.)



This community and others like it in Reynosa have grown very fast—“a block a week,” according to one, “a block per day,” according to another—and now estimates of the city’s population range from 750,000 to 1.2 million. (Photo courtesy of Chad Broughton.)

Matamoros are even greater than their Texas counterparts. Although some sources report Reynosa’s population at about 450,000, others have reported it to be more than 750,000 or even as high as 1.2 million (Broughton, 2003; McAllen Economic Development Corporation, 2000; Real Estate Center at Texas A&M University, 2002). Stark contrasts exist between the modern maquiladora factories that drew Mexican workers to the border and the communities where the workers live south of the border. When one city official told a sociology professor studying Reynosa that Reynosa grew at a rate of “a block per week,” another official corrected him: “Per day,” he said. However, the central

and northern portions of Starr, Hidalgo, and Willacy counties are currently sparsely populated and projected to remain so, functioning primarily as ranching areas.

WATER RESOURCES

The Rio Grande is the primary source of water for almost all agricultural, municipal, and industrial users in the Lower Rio Grande Valley region (Lower Rio Grande Valley Development Council, 2002). The regional water supplies are stored upstream as surface water in Falcon and Amistad international reservoirs. There is a small supply of

Table 2.1. Population, Housing Units, Area, and Density—Lower Rio Grande Valley, 2000

County	Population	Housing Units	Land Area (Square Miles)	Density/Square Mile	
				Population	Housing Units
Cameron	335,227	119,654	906	370	132
Hidalgo	569,463	192,658	1,570	363	123
Starr	53,597	17,589	1,223	44	14
Willacy	20,082	6,727	597	34	11
Total	978,369	336,628	4,295	228	78
Texas	20,851,820	8,157,575	261,797	80	31

Source: Data from U.S. Census Bureau, 2000.

potable groundwater that is pumped by several municipalities and a few irrigated farms, but the region is largely dependent on the Rio Grande, as is the neighboring *Frontera* region of Tamaulipas, Mexico. Below El Paso, the majority of the water that flows into the Rio Grande is drainage from the Rio Conchos basin in the Mexican state of Chihuahua (due south of El Paso). In recognition of this, the United States and Mexico signed a bilateral water-sharing treaty in 1944 specifying minimum amounts of water to be allowed to flow into the Rio Grande from the Mexican tributaries. During the 1990s, Mexico began a series of annual deficits of the required minimum inflows which, after several years of drought, began to have a negative impact on the agricultural industry in the Lower Rio Grande Valley, which depends on irrigation, and the entire economy of the Tamaulipas *Frontera* region by causing water shortages (Stubbs et al., 2003). This issue is currently unresolved and continues to accrue negative economic pressure on irrigated agriculture in the Lower Rio Grande Valley basin (Robinson, 2002). Even with these problems, the water supplies in U.S. possession are allocated to ensure that all projected municipal and industrial demands are satisfied. As the region continues to urbanize, the water supply that now meets the demands of irrigated agriculture (which currently has 85% of the water rights) is projected to shift to municipal and industrial uses as irrigated land is developed (Lower Rio Grande Valley Development Council, 2002).

From a health standpoint, the more pressing water issue is water quality. The Rio Grande water quality is naturally low due to high salinity levels. Because the Rio Grande is an international river running through a rapidly urbanizing, industrializing region, it is subject to pollution and contamination from sewage and chemical pollutants (see Johnson and Jacobs [1997] for a lengthy bibliography). In particular, high fecal coliform levels in the vicinity of the border cities represent a major potential health problem for recreational users of the river (who are plentiful on the Mexican side). Another indicator of this problem, with direct nutritional implications, is represented by an ongoing research program by the federal Centers for Disease Control and Prevention, Texas A&M University, and others to study relationships between fecal coliform levels on fresh produce irrigated with Rio Grande water (Moe, 2003).

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