



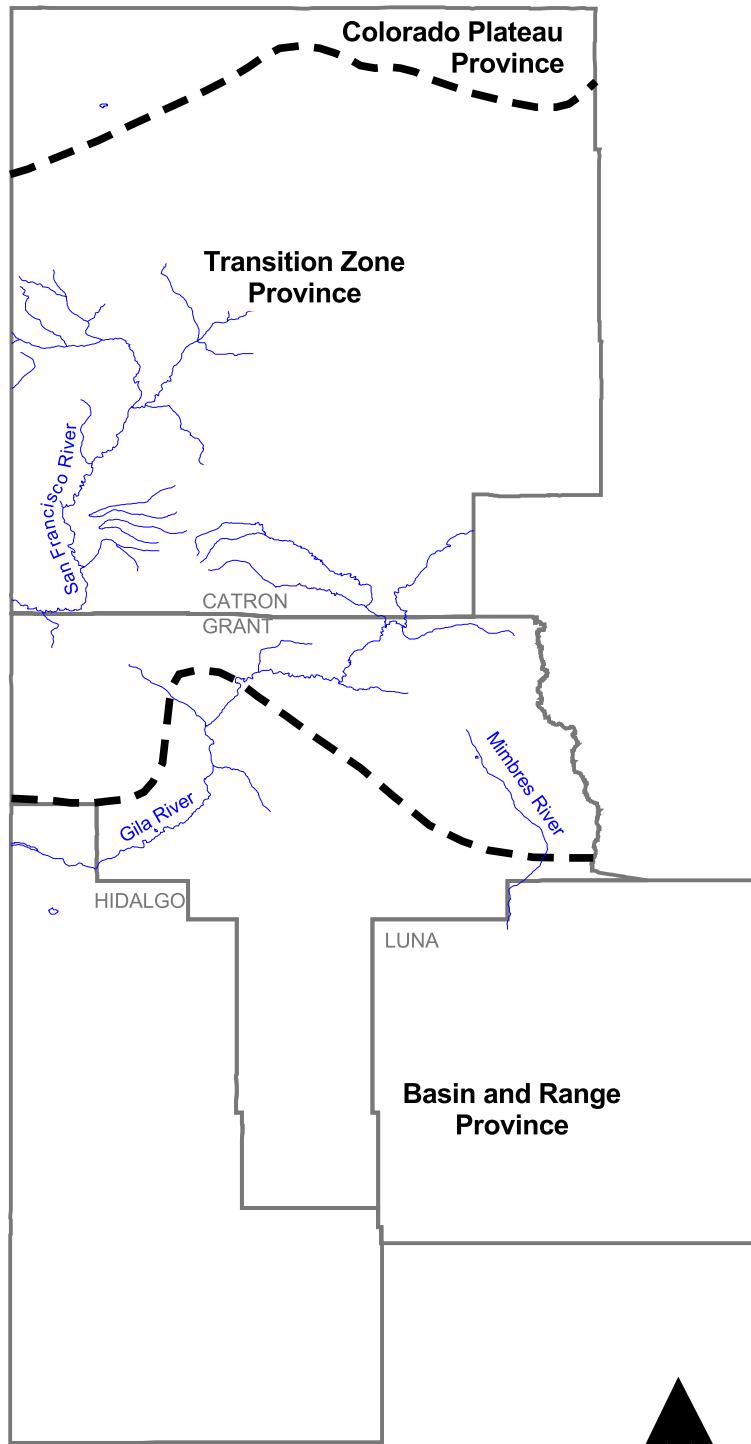
3. General Description of the Planning Region

In accordance with the regional water planning template (NM ISC, 1994), this section provides a general description of the planning region, climate, water resources, and water use. Additional detail on the climate, water resources, and demographics and water use of the region is provided in Sections 5 and 6. Maps illustrating the land use and general features of the region were prepared by WRRI and are provided in Appendix A2.

The Southwest Region is located in the southwest corner of New Mexico and is comprised of four counties: Hidalgo, Luna, Grant, and Catron. The region is bounded on the north by Cibola County, on the west by Arizona, on the south by Mexico, and on the east by Socorro, Sierra, and Doña Ana Counties. The total area of the Southwest Region is approximately 17,000 square miles. Elevations range from over 10,000 feet above mean sea level (ft msl) in the Gila Wilderness to about 3,000 feet in the southern basins.

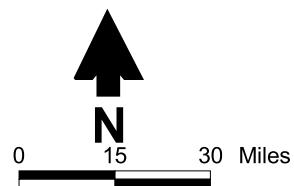
The region includes parts of three major geologic physiographic provinces, as shown in Figure 3-1:

- The northwestern corner of the Southwest Region (northern Catron County) lies within the Navajo Section of the Colorado Plateau Province. The Colorado Plateau extends throughout a vast area, including portions of New Mexico, Arizona, Colorado, and Utah, but is present in only a small portion of the planning region. The topography is characterized by large flat plateaus and buttes separated by wide valleys and locally incised canyons (OSM, 1996). The Colorado Plateau Province is comprised mainly of numerous sedimentary rock formations that are locally overlain by Quaternary/Tertiary alluvium and basalt.
- The remainder of Catron County and much of Grant County lies within the Datil-Mogollon section of the Transition Zone province. As the name implies, this area is a transitional zone between the Colorado Plateau Province and the Basin and Range province to the south (RTI, 1991). The Datil-Mogollon section is comprised of intermontane basins filled with sediments and large-scale intrusive plutons and associated extrusive volcanics.



Explanation

- Perennial stream
- Physiographic province
- County



SOUTHWEST NEW MEXICO REGIONAL WATER PLAN

Physiographic Provinces



- South of the Transition Zone province lies the Mexican Highland section of the Basin and Range province, which covers the remainder of the Southwest Region. The geology of the Basin and Range province is characterized by north-south trending mountain ranges separated by basins that have been partially filled with sediment eroded from the mountains. The mountains are comprised of bedrock and encompass approximately 20 percent of the Basin and Range province in New Mexico (Hawley et al., 2000).

These physiographic provinces are discussed further in Section 5.3.1.

Vegetation in the planning region is greatly influenced by elevation differences and ranges from the spruce, fir, pine, and aspen forests of the mountains through a transition of open piñon-juniper to the grasslands of the basin floors. Natural resources in the area include coal, methane gas, and base metals, particularly copper.

3.1 Climate

The varied terrain of the Southwest Region, which ranges from the Continental Divide to the Chihuahuan Desert, results in significant climate variations. For example, temperatures range from lows that are well below 0 degrees Fahrenheit ($^{\circ}\text{F}$) in the mountains to highs of more than 100°F in the basins.

The average annual temperatures in the four-county area for 1950 through 2002 ranged between about 46°F in the higher elevations and 61°F in the lower elevations. Average annual temperatures increased slightly over the period of record, mostly due to rising minimum temperatures.

Precipitation also varies across the region, influenced by location and by elevation. Weather systems may enter the region from the west (Pacific), northeast (Arctic air masses from the plains), and southwest (Gulf of Mexico), and systems from each point of origin bring unique sets of temperatures and moisture to the region. Average precipitation, including both snowmelt and rainfall, ranges from about 11 inches in the lower elevations to 17 inches in the higher elevations. On average, 16 to 25 percent of precipitation in the region falls during winter months.



3.2 Major Surface Water and Groundwater Sources

Approximately 20 percent of the water currently used in the planning region is supplied by surface water, which is primarily used for irrigated agriculture. Surface flows originate primarily in the higher elevations, as snowmelt during the spring and as monsoonal rainfall during the late summer. Flows are highly varied from year to year, and the streams are typically characterized by short-duration high flows, with prolonged durations of low flows. The dominant waterways flowing in the region (Figure 3-1) are in the Upper Gila River Basin (southeastern Catron County, western Grant County, and northern Hidalgo County), the San Francisco River Basin (southwestern Catron County and northwest corner of Grant County), and the Mimbres River Basin (southeastern Grant County and Luna County). The region's rivers and variability in their supply are discussed in Section 5.2.1, and Section 5.2.2 presents information on the lakes and reservoirs within the planning region. Surface water availability varies greatly from year to year, depending on the amount of precipitation in the region.

The occurrence of groundwater in the region is highly varied, and is controlled to a large extent by the geologic province in which the aquifer is located.

- Within the Colorado Plateau portion of the planning region, groundwater exists primarily in sedimentary formations, most predominantly the Dakota Sandstone (Basabilvazo, 1997). Tertiary volcanics and Quaternary/Tertiary alluvium also contain localized groundwater, but they are not extensive enough to be considered a regionally important groundwater source.
- Within the Transition Zone province, groundwater is found in Quaternary alluvium, Gila Group, and Tertiary intrusive volcanics. The Gila Group is the most extensive productive aquifer, while the alluvial and volcanic aquifers are areally limited but known to produce locally significant amounts of water.
- Within the Basin and Range province, the main aquifers are the basin fill, which includes several units of Quaternary alluvial and lacustrine deposits, as well as the Tertiary Gila Group. The basin fill contains most of the readily available (inexpensive) groundwater



resources within the Southwest Region. In general, the basin fill aquifers are moderately to highly permeable, the water table in them is within 200 feet of ground surface, and the water is of good quality.

3.3 Demographics, Economic Situation and Land Use

Current statistics on the population, economy, and land use in each county in the Southwest Region were compiled from the New Mexico Economic Development web site (NMEDD, 2003) and are summarized in Table 3-1. Additional detail on demographics, economics, and land use within the region is provided in Section 6. As shown in Table 3-1, from 1990 to 2001 the population increased in three of the four counties, with the only decrease occurring in Hidalgo County. Per capita income increased in all four counties, and the number of business establishments increased in all the counties except Hidalgo. Agriculture is an important industry in the planning region, especially in Luna and Hidalgo Counties, but the largest employment categories generally across the region are government (local, state, and federal), accommodations/food service, retail, and health care/social services, with mining and manufacturing employing large numbers in Grant and Luna Counties, respectively.



Table 3-1. Summary of Demographic and Economic Statistics for the Southwest New Mexico Water Planning Region

County	Population in 2000 ^a	Average Per Capita Income (\$/yr)		No. of Businesses		Farms			Largest Agricultural Commodities	Largest Employment Categories, 2001		
		1990	2001	1990	2001	No.	Acreage			Industry ^b	No. Employed	
							Total	Average				
Catron	3,567	11,768	14,003	48	73	236	1,795,362	8,274	Cattle Hay Wheat	Government Hospitality Retail Agriculture Health/social	394 60 41 36 16	
Grant	31,083	12,457	18,955	605	671	154	1,173,599	4,103	Cattle Horses Hay/silage Nursery crops Fruit/nuts/berries	Government Retail Hospitality Health/social Construction	3,076 1,146 1,100 810 670	
Hidalgo	5,929	12,837	17,258	113	101	85	1,104,820	7,567	Vegetables Cattle Nursery crops Corn for grain Cotton	Government Agriculture Hospitality Retail Health/social	7,191 ^c 539 337 162 139	
Luna	25,189	11,219	15,565	346	403	192	603,428	3,143	Vegetables Cattle Cotton Hay/silage Fruit/nuts/berries	Agriculture Government Manufacturing Retail Hospitality	2,287 1,752 1,842 1,075 552	

Source: NMEDD, 2003, unless otherwise noted.

^a Southwest Planning & Marketing estimate
(Section 6.2)

^b Government = Local, state, and federal government
Hospitality = Accommodations/food service
Health/social = Health care/social services
Transportation = Transportation/warehousing

^c The web site listed the number employed by federal government as 6,771. As the county population is only 5,343, this number may be inaccurate.