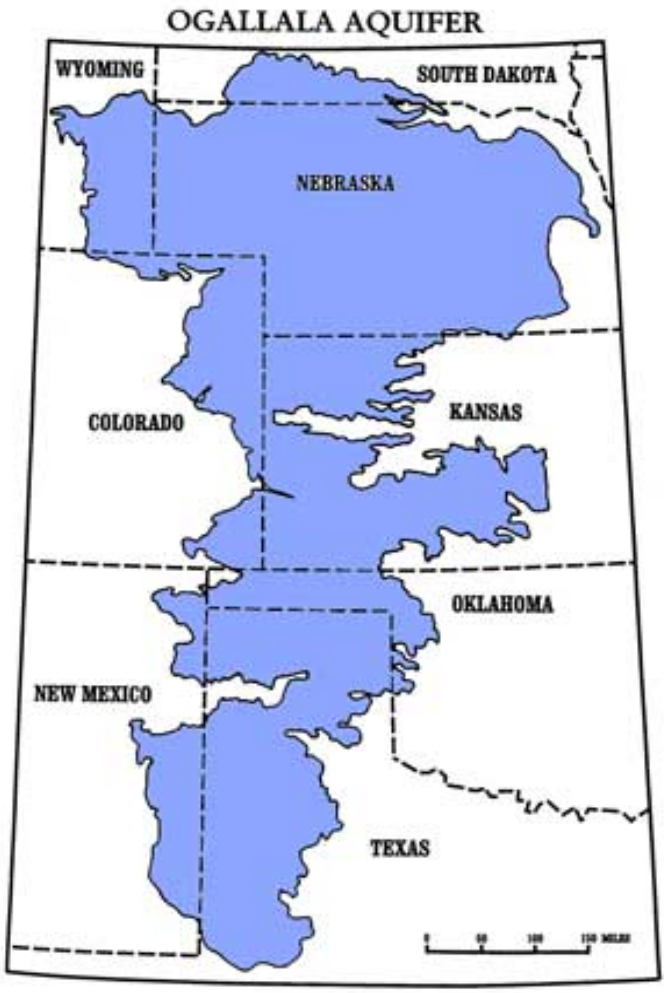
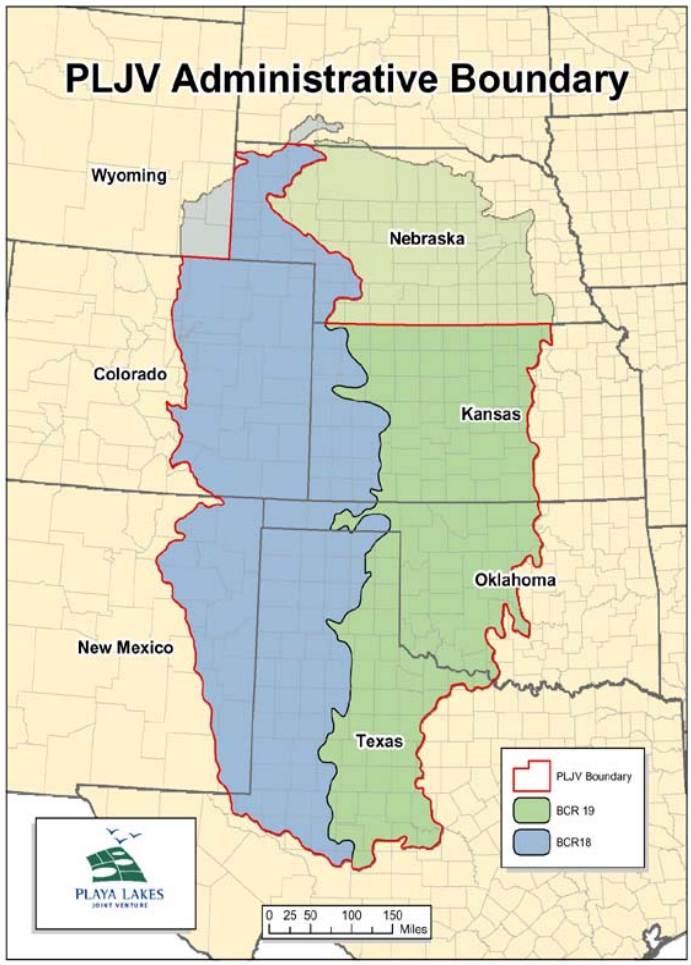
# Playas and the Ogallala Aquifer – What's the Connection?

The Ogallala Aquifer underlies approximately 174,000 square miles of the western Great Plains region, particularly in Texas, New Mexico, Oklahoma, Kansas, Colorado and Nebraska. The Ogallala has long been a major source of water for municipalities, industries, and most notably agricultural development, since the turn of the century. More than 95 percent of the water pumped from the aquifer is used for irrigation. The resource is the driving force behind agricultural economies of the western Great Plains. In 1949, the Ogallala irrigated 3.5 million acres – by 1997, it irrigated 14 million acres. Consequently, the aquifer's water supply has declined steadily since the 1940s and recent figures show a 1.35-ft. drop per year from 1992 to 1997. Although current dry land farming techniques have resulted in reduced pumping, the amount of groundwater being withdrawn still greatly surpasses the aquifer's natural rate of recharge.

Mounting evidence points to playa lakes as the primary source of natural recharge for the Ogallala Aquifer. Playas are shallow, seasonal wetlands that are generally round and small with clay basins and are located across the grasslands of the western Great Plains. They are the most numerous wetland in the region, totaling more than 60,000. Playa lakes lie in the lowest point in a large, closed watershed, collecting rainwater and runoff from surrounding uplands. Numerous studies indicate that recharge into the Ogallala is focused under playas and can exceed three inches of water per year.[1] Maintenance of functioning playas is therefore critical to sustaining irrigation-based agricultural economies of the western Great Plains. The Playa Lakes Joint Venture (PLJV) conserves playa lakes, other wetlands and associated landscapes through partnerships for the benefit of birds, other wildlife and people.




The Ogallala Aquifer underlies a major portion of the PLJV's administrative boundaries and Bird Conservation Regions (BCRs) – where nearly all playa lakes occur.

PLAYA LAKES JOINT VENTURE

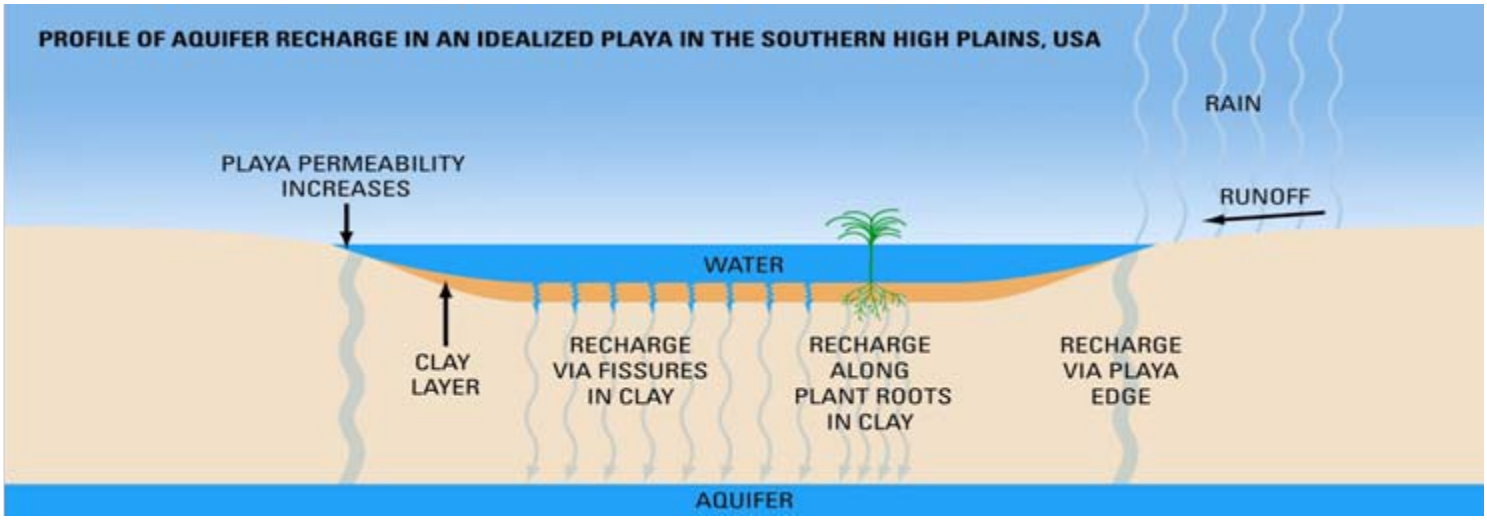
# How does recharge work and why must playas be maintained?

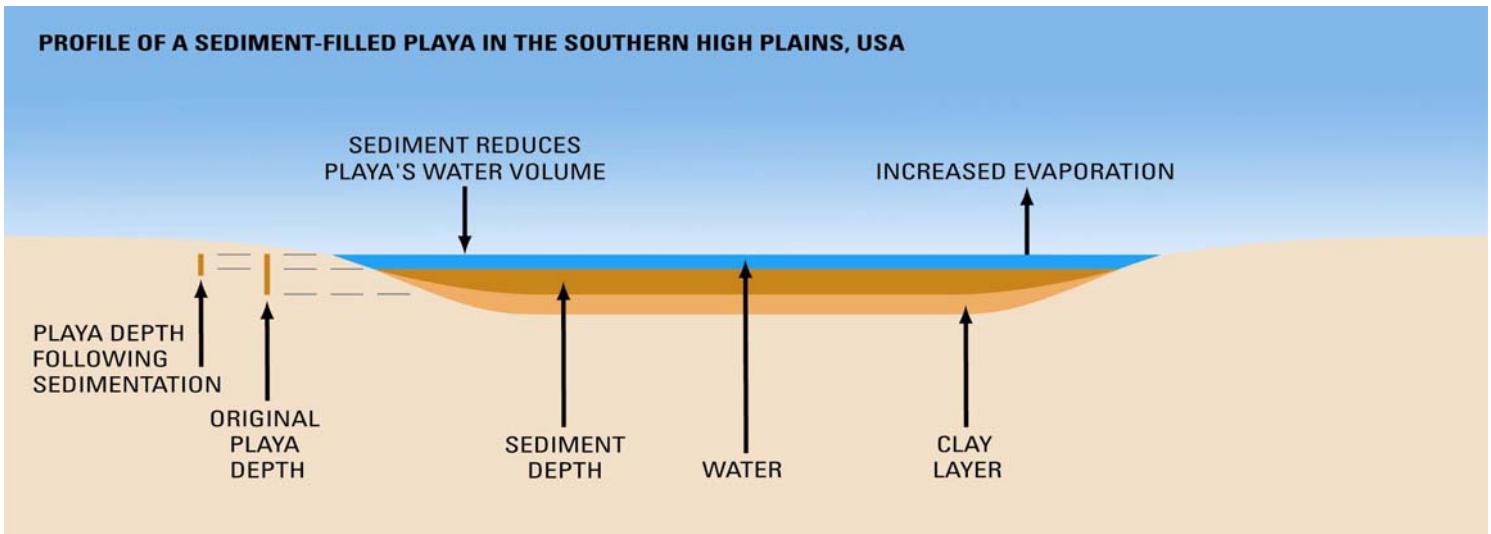
Aquifer recharge occurs through playa basins and along the perimeter of playas. When a dry playa receives a surge of water from rainfall or associated runoff, water flows into the playa basin and penetrates the clay layer through large cracks and plant root openings in the floor. These cracks eventually swell shut and become impermeable as the clay absorbs more water. Recharge also occurs along playa perimeters where clay is thin or non-existent. Current research on playas in the Southern High Plains of Texas found that recharge rates in playa basins exceeds three inches per year in unaltered playas. More than 70 percent of playas have been altered from their natural state by tilling, pitting, intentional filling or filling through sedimentation.

Of all these, sedimentation is the most critical threat to playa function, especially in regard to groundwater recharge[2]. Sedimentation occurs on all playas that are surrounded by tilled lands. Water from rain and irrigation carry soil into playas, gradually filling them. Sediment build up reduces the volume of water playas can hold and increases the rate of water loss through evaporation, thus limiting recharge.

The PLJV and its partners work with landowners in Colorado, Kansas, Nebraska, New Mexico, Kansas and Texas, providing technical and financial assistance to conserve playas in agricultural and range land. Joint Venture partners have invested and leveraged close to $50 million for hundreds of conservation projects since 1989. For more information contact the PLJV at:

103 E. Simpson, Lafayette CO 80026; tel (303) 926-0777; fax (303) 926-8102; www.pljv.org




[1]Wood, W.W. 2000. Ground-Water Recharge in the Southern High Plains of Texas and New Mexico. United States Geological Survey FS-127-99.
[2]Luo, Hong-Ren, L. M. Smith, B. L. Allen, and D. A. Haukos. 1997. Effects of sedimentation on playa wetland volume. Ecological Applications 7: pp. 247-252.