



Issue: The Hill Country Groundwater Supply

Photo by: Larry Alford



Photo by: Milan Michalec

As long-time landowners and new residents alike know, the Texas Hill Country is a special place.

The people are friendly, the air is clean, and the landscape is beautiful. But that is true of much of rural Texas. What gives the Hill Country its very special character are its extraordinary water resources: its magical hidden springs, crystal-clear swimming holes, peacefully wandering creeks, and clear, swiftly flowing rivers.

These precious Hill Country resources supply our drinking water and allow for irrigation of pastures, farms, and vineyards. They also contribute to the region's amazing quality of life and, from a practical perspective, help us maintain some of the highest property values in the state and healthy, diverse local economies. However, our water supplies are limited, and require sound management to sustain in the face of exploding demand.

springs and creeks, is being pumped down faster than it can be replenished by rainfall. Some wells are already drying up during hot, dry summers. Residential users are often competing with ranchers' and farmers' deeper wells and bigger pumps for the limited resource, and the conflicts show no sign of abating any time soon.

If we want to keep the Hill Country intact for our families and protect the sustainability of our natural resources, we must wake up to these threats and get beyond rhetoric with viable solutions that balance water use with our wish to conserve our natural heritage.

Water in the Hill Country Is at a Crossroads.

For most of the last century, the Hill Country was sparsely populated. Even after the prolonged drought-of-record (1947-56), which demonstrated the limited nature of Hill Country water supplies, there was still plenty of water to go around. Over the last 20 years, however, our surface water and groundwater resources have come under great pressure from population growth and new development, much of which was poorly planned. In many areas, the hidden cache of water stored in our aquifers, which support the flow of

Everyone living in the Hill Country has a vital interest in protecting our water resources, but we don't all have time to be hydrologists or water-policy experts. This brochure is intended as a handy guide to the basic water issues and challenges facing the Hill Country, and offers some tips about how you can get involved, even with just the touch of a button on your computer or a quick phone call.

"There is no doubt that land having surface water and/or groundwater resources holds significantly more value than land which does not. This, coupled with location, is perhaps the single most important factor in establishing the value of rural land. With the passage of time, and further diminishment of water resources, this can only increase in importance for anyone evaluating rural land as an investment, homesite, farm, working and/or recreational ranch."

— David E. Culver
Owner/Broker, LANDTX



hillcountryalliance.org

The Hill Country's Extraordinary Water Resources

The Hill Country contains several environmentally significant rivers and hundreds of miles of contributory streams. In addition to the stunning beauty of these waterways and the surrounding landscape, these rivers and streams support many species of fish, birds, and other wildlife. The unique vegetation alongside the rivers, including bald cypress, pecan, willow, sycamore, majestic oaks, and backwater wetland areas are incredibly important wildlife habitat. This streamside vegetation is part of what is called the "riparian zone," crucial to the health of the stream and purity of the waters.

The source of these rivers and streams is the limited reserve of water which lies beneath most areas of the Hill Country. Assorted aquifers, including the relatively extensive Trinity Aquifer and the shallower, somewhat discontinuous Edwards Aquifer are generally replenished by rainfall seeping through the ground and streamflow leaking through streambeds. Water from these aquifers discharges onto the surface in some areas, forming gushing springs or small seeps that replenish stream and river flow. In fact, in most cases, springs and seeps supply most if not all of the flow in streams and rivers during the drier months of the year.

These aquifers are the lifeblood of Hill Country existence, including wildlife. As population and development have exploded in many parts of the Hill Country, use of both surface water and groundwater has increased significantly.

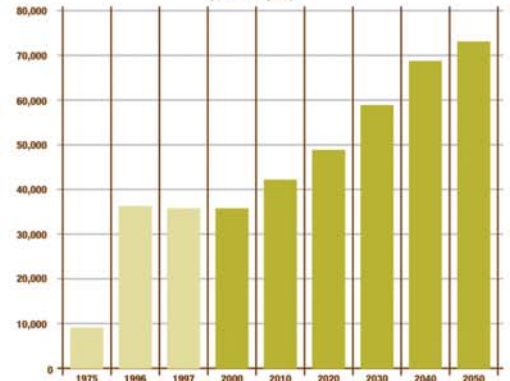
Unlike surface water, groundwater use is not centrally managed by the state and is regulated separately. In some areas, there is no management at all of groundwater pumping. In most others, locally elected Groundwater Conservation Districts can require registration of wells and issue pumping permits, as well as set management goals for conserving groundwater. However, districts can only regulate large groundwater withdrawals. Groundwater Conservation Districts and water-supply planning are overseen by the Texas Water Development Board (TWDB). Unfortunately, most Groundwater Conservation Districts are significantly underfunded, inadequately staffed and unable to fully regulate heavy pumping. Because many aquifers are poorly researched, not enough is known about recharge and sustainable pumping levels, especially as affected during severe droughts.

During dry periods in some areas of the Hill Country, including around Boerne, Bandera, Comfort, Kerrville and Wimberley, increases in groundwater pumping from the Trinity Aquifer have caused withdrawals to exceed recharge, resulting in declining water levels, increased pumping costs, reduced spring flows and, in some cases, dry wells. Blanco has also experienced the effects of severe water shortages during years the Blanco River goes dry and only limited groundwater is available.



Photo by: Steve Horne

Groundwater withdrawal
(acre-feet/year)



Texas Water Development Board (TWDB) graph of past and projected groundwater pumping in the Hill Country's Edwards and Trinity Aquifers. (Source: TWDB, Groundwater Availability of the Trinity Aquifer, Hill Country Area, Texas: Numerical Simulations through 2050 (2000).)



Population growth from 1960-2010 in the Hill Country counties that make up Groundwater Management Area 9: Bandera, Bexar, Blanco, Comal, Hays, Kendall, Kerr, Medina, and Travis. Source: U.S. Census Bureau.

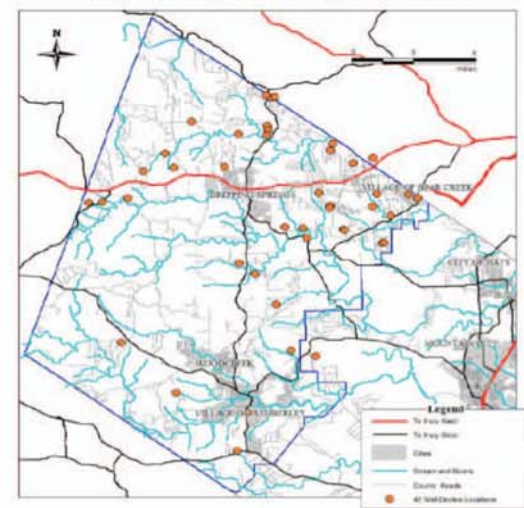


Photos of Curry Creek's Edge Falls in Kendall County during and after the drought of 2007-2009. During the drought, aquifer-fed springs and wells went dry across the Hill Country. Good management is key to preventing devastating effects from future droughts. (Photos: Milan J. Michalec)

Surface water use is permitted by the state of Texas, through the Texas Commission on Environmental Quality (TCEQ). Cities and river authorities, such as the Lower Colorado River Authority and the Guadalupe-Blanco River Authority, already hold permits for most of the surface water in Hill Country streams and rivers, though in some areas long-time landowners hold individual permits.

You can access a hydrological atlas of the Trinity Aquifer, which shows the aquifer's layers and hydrogeologic qualities, at <http://repositories.lib.utexas.edu/handle/2152/8977>.

HTGCD Reported Dry Wells 2009



This is a map of dry wells reported in the Hays Trinity Groundwater Conservation District in 2009. Wells in other parts of the Hill Country, including Kerr County and Bandera County, also went dry in 2009.

Conserving Groundwater and Protecting Springs and Property Rights

The need to manage and conserve groundwater is recognized in the Texas Constitution, by virtue of the 1917 Conservation Amendment (Article 16, Sec. 59(a)). The preferred approach in Texas is local management through groundwater districts with elected board members. The Legislature authorized the creation of Groundwater Conservation Districts in 1949, and the first district was created in 1951. There are now 96 groundwater districts in Texas, many of which have existed for decades, others only recently established. This approach seeks to balance the historic private right-to-pump and “capture” groundwater with reasonable and equitable water-management policy for a growing state.

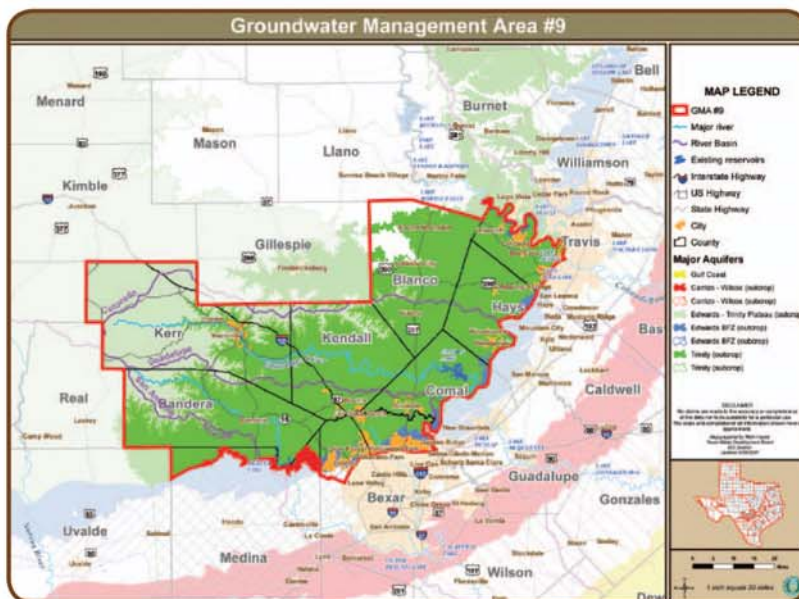
Under current law, Groundwater Conservation Districts can, in general, require that all wells be registered and, where necessary, require permits and apply pumping limits to larger wells. Districts are responsible for ensuring that water use is balanced between new and existing users and that the future of the aquifer as a water source is protected. Simply stated, groundwater districts generally try to prevent the aquifer from being drained faster than it can be replenished by rainfall. Groundwater districts do not have the authority to control land use.

Wells equipped to pump no more than 25,000 gallons per day (17.4 gallons per minute) on ten acres or more are generally considered exempt from regulation by groundwater districts. These so-called “exempt” wells include the vast majority of individual residential wells and those used for livestock. Districts are prohibited from requiring meters on exempt wells. In several high-growth Hill Country counties, the huge explosion of exempt and unmetered water wells has become a large factor in water planning – an unknown factor with unknown consequences that must be estimated.

In 2005, the Legislature set up a process through which groundwater districts could work together to conduct joint planning to manage shared aquifers. This “groundwater management area” or “GMA” process also requires that the districts set Desired Future Conditions (DFCs) for the aquifers. Specifically, the DFC establishes the parameters within which the aquifer will be managed over the next 50 years. A conservative DFC, carefully managed region-wide, is currently the best way to protect private property groundwater rights. For more on the GMA process, see www.texaswatermatters.org/groundwater. GMA 9 includes much of the Texas Hill Country.

In 2010, GMA 9 adopted desired future conditions for several Hill Country aquifers. For the Trinity Aquifer, the main source of Hill Country groundwater, the GMA adopted a region-wide water-level decline of an additional 30 feet through year 2060, as averaged over the entire management area. As time progresses, it may become prudent to refine the expectations of this proposed draw down to a more conservative level to sustain water supply and spring flows. The sustainability of water in the Hill Country requires that pumping does not exceed the amount of rainfall that recharges the aquifer annually. Adaptive-management policies may be necessary in order to protect current users and accommodate future projected population growth.

Some high-growth areas of the Hill Country, particularly southwestern Travis County and Comal County, have yet to either join an existing groundwater district or form a new one. This means there is little or no management of groundwater pumping in these areas.



Map from the Texas Water Development Board.

Issues and Challenges

GMA 9 Aquifer Decline: The desired future condition adopted by GMA 9 would allow a time-averaged additional 30 feet of regionalized water-level decline in the Trinity Aquifer by 2060. The increased pumping could cause additional declines that would likely result in existing groundwater users experiencing dry wells (as many did with much less pumping during the drought of 2008-2009), requiring well owners to pay for the drilling of deeper wells and the drying up of critically important springs, such as Jacob's Well, which provides base flow to Cypress Creek.

Increasing the Effectiveness of Local Groundwater Management: Some of the newer Hill Country groundwater districts were created without the complete range of tools available to other groundwater districts in the state, as set forth in Chapter 36 of the Texas Water Code. For example, the Hays Trinity GCD in Western Hays County was created without the adequate funding necessary to carry out its management functions. The HTGCD does not have the authority laid out in Chapter 36 of the Texas Water Code to even call for a public vote on a nominal ad valorem property tax or to charge production fees for commercial or public water supply systems. Instead, the district must rely on one-time well registration fees of \$300 per well to fund its science, administrative, education, and permitting programs, all of which are necessary for effective management of a vital resource under increasing developmental pressure. As a consequence of the limited revenue stream, this district relied on supplemental funding from Hays County for the past four years. Because support from the county is problematic and unlikely to continue, the district's viability and effectiveness are in jeopardy.

High-Growth Areas With No Groundwater Management: Critical high-growth areas of the Hill Country, including southwestern Travis County and western Comal County, currently have no policy of groundwater management in place. After extensive study, the Texas Commission on Environmental Quality has determined that management is needed to prevent further deterioration of aquifer levels in these areas and recommended the creation of a new locally elected Groundwater Conservation District. A hearing on this proposal is currently underway, though the Legislature or citizens' petition to the TCEQ could also act to create such a district.

Tax Myths: Some landowners are skeptical about groundwater districts because they are concerned that their adoption might result in higher property taxes. While it is true that many districts are authorized to raise operating funds through small ad valorem (property) taxes such rates are generally very low (an average of 1.5 cents per \$100 of assessed valuation for Hill Country GCDs), and the district's taxing authority can be capped by the Legislature. Thus, for little more than the annual cost of a six-pack of soda, landowners can be assured that there is a program in place to help manage the aquifer, keep existing wells pumping, and protect flows in springs and streams.

Getting Involved

Protect Your Groundwater: Many people buy rural property without ever having depended on water from a well. It is crucial to protecting your groundwater that you site your well and septic tank properly – with the well always upstream! Never dump motor oil, antifreeze, pesticides or other toxic chemicals anywhere – take them to the proper disposal location in town. You ARE what you drink!

Use native plants and avoid planting lawns and landscaping that require a lot of watering. The water that recharges our aquifers, feeds our thousands of springs and maintains our streams across Texas is filtered through deep rooted native plants. Every citizen, urban and rural, can explore and utilize the full palette of readily available native species when engaging in land management activities.

Take advantage of the many resources now available to incorporate water conservation practices into your life. Consider a rainwater harvesting system for your home or simple rainwater collection barrel for your garden. Teach your children about conserving water and lead by example.

Join With Others to Make Your Voice Heard: Help support the Hill Country Alliance's efforts to protect water resources. HCA seeks to ensure that water-management decisions are made using good science toward a goal of balancing water demand with the need to protect our springs, streams, rivers, and groundwater for future generations. Find out more at www.hillcountryalliance.org.

Elected Officials: Let your local elected officials and legislators know that you care about the future of the Hill Country's water resources. Ask them to support reasonable and effective groundwater management policies and the collection of relevant information on how aquifers support springs and streams, aquifer recharge, and water quality. Ask them to make sure that new users don't adversely affect existing water wells, especially during drought periods. A list of Hill Country legislators can be found at www.hillcountryalliance.org/HCA/TexasLegislature2011.

Groundwater Management Districts: If you live in an area with a groundwater conservation district (GCD), the district needs to hear from you. This is because it is through public participation that the district management plan is developed, as are the rules that are used to meet the management goals and objectives. Most GCD boards meet monthly and have websites explaining their plans and programs. Contact information for GCD's and other helpful resources are listed on this page for your convenience. The Hill Country is irreplaceable. It is our responsibility to conserve for future generations.

"The world is run by those who show up."

– David K. Langford,
Retired Executive Vice President,
Texas Wildlife Association



Photo by: Dave Hensley

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Groundwater Conservation Districts in the Hill Country GMA 9 Area:

Bandera County River Authority
and Groundwater District
www.bcragd.org

Barton Springs/Edwards Aquifer
Conservation District
www.bseacd.org

Blanco-Pedernales Groundwater
Conservation District
www.blancocountygroundwater.org

Cow Creek Groundwater
Conservation District (Kendall County)
www.ccgcd.org

Edwards Aquifer Authority
www.edwardsaquifer.org

Hays Trinity Groundwater Conservation District
www.haysgroundwater.com

Headwaters Groundwater
Conservation District (Kerr County)
www.hgcd.org

Medina County Groundwater
Conservation District
www.medinagwcd.org

Trinity Glen Rose Groundwater Conservation
District (Bexar County)
www.trinityglenrose.org

Additional Resources:

Texas Water Development Board
www.twdb.state.tx.us

Texas Commission on Environmental Quality
www.tceq.state.tx.us

Texas Alliance of Groundwater Districts
www.texasgroundwater.org

Hill Country Alliance
www.hillcountryalliance.org



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