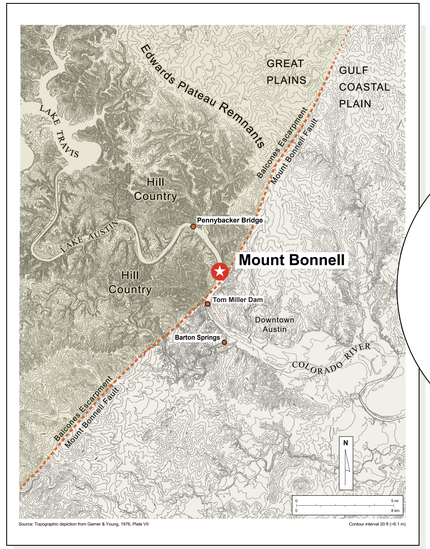
Mount Bonnell and the Balcones Escarpment

What is an Escarpment?



Source: Topographic depiction from Garner & Young, 1976, Plate VII

Contour interval 20 ft (~6.1 m)

An escarpment is an area where the elevation of the earth changes suddenly forming a line of hills or scarps. At **Mount Bonnell**, you are atop the **Balcones Escarpment**.

The **Balcones Escarpment** runs through Central Texas from Austin, southwest through San Antonio, and from there to the Rio Grande (Big River) near Del Rio. It marks the boundary between the **Great Plains** stretching west, and the **Gulf Coastal Plain** to the east. The break in the landscape defines major differences in earth resources, weather and climate, soils, vegetation, and animal habitats. East of the escarpment are the prime farmlands of the **Blackland Prairies**; to the west are the rangelands and woodlands of the **Hill Country** and the **Edwards Plateau**. The **Balcones Escarpment** marks the beginning of the American West in terms of landscape, ecology, geologic processes, and human endeavors.

Physiographic maps show the locations of major landforms--plateaus, plains, and mountain ranges.

Physiographics Regions and *Subregions*

- Great Plains
  - *Edwards Plateau*
  - HC *Hill Country* (**HC**)
- Gulf Coastal Plain
  - BP *Blackland Prairies* (**BP**)

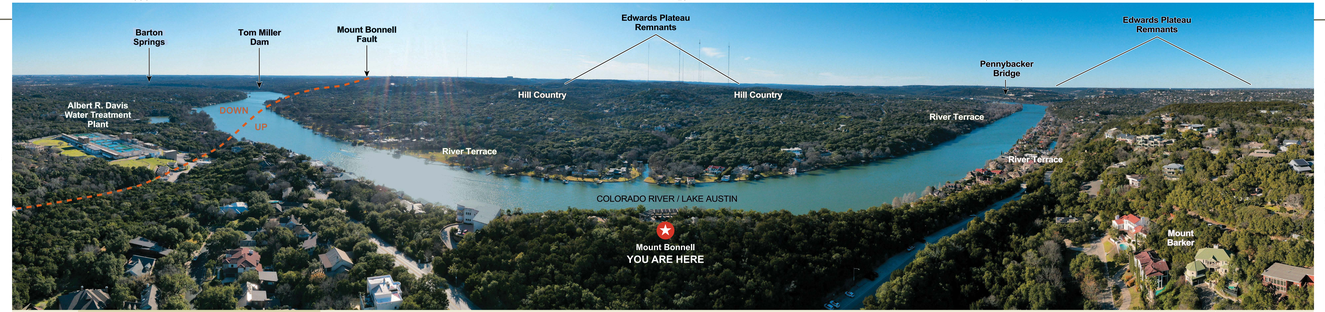
Boundaries

- Great Plains
- Balcones Escarpment

Did You Know?

The Balcones Fault Zone was active between 20 and 15 million years ago. Although no major earthquakes along the Balcones Fault Zone have occurred in recorded history, this does not mean that earthquakes could not happen again! In fact, two small historic earthquakes (1873 and 1902) in Travis County may have been caused by small movements along the Balcones Fault Zone.*

* Source: Frohlich, C., and S. D. Davis, *Texas Earthquakes*, Univ. Texas Press, 275 pp., 2002

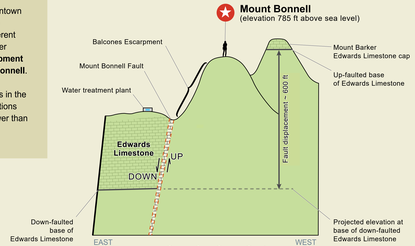


Spherical, aerial (drone) photo credit: Chris Zahm, Bureau of Economic Geology

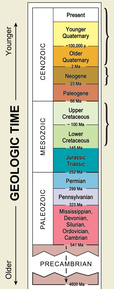
Mount Bonnell (785 ft. above sea level and 300 ft above Lake Austin) overlooks the **Balcones Escarpment** and provides a panorama of downtown Austin to the east and the eroded edges of the **Edwards Plateau** to the west. These very different landscapes were sculpted by the Colorado River and its tributaries to form the **Balcones Escarpment** along the main fault line at the foot of **Mount Bonnell**.

The **Mount Bonnell Fault** is one of many faults in the **Balcones Fault Zone**. In this area, rock formations east of the **Mount Bonnell Fault** are 600 ft lower than the rock formations to the west of the fault.

Mount Bonnell Fault



Simplified Cross Section



Source: Geologic Society of America, Website from Geologic Time Scale v. 4.

Geologic History

3 **EROSION** of the landscape by the Colorado River and its tributaries began around 15 million years ago. The Edwards Plateau once extended unbroken across Central Texas. With faulting, aggressive down-cutting by the Colorado River began. Streams sculpted the landscape, leaving isolated remnants of the Edwards Plateau and forming the Balcones Escarpment.

2 **DISPLACEMENT** of rock strata across the Mount Bonnell Fault occurred about 20 to 15 million years ago. Rock layers were displaced upward west of this break relative to the down-dropped strata to the east.

1 **DEPOSITION** of strata (layers of rock) in the Austin area occurred about 66 to more than 100 million years ago. During this period, the sea covered all of Central Texas. Variable marine conditions, such as depth, water temperature, and salinity produced sand, limy ooze, and clay deposits that eventually hardened into the bedrock strata that we see today.

Mount Bonnell's geologic history includes three major events that took place between 100-plus million years ago and the present, and that shaped today's landscape.

Groundwater in the Fault Zone

Barton Springs

Springs are natural sites where groundwater flows to the surface. About 4 miles south of Mount Bonnell, **Barton Springs**, the fourth-largest spring system in Texas, has an average flow of approximately 22,400 gallons per minute from the Edwards Aquifer. This spring water, issuing from faulted limestone, supplies water to Barton Springs Pool in Austin's *Zilker* Park. The cavernous aquifer provides a habitat for an endangered species of salamander that lives in these springs and nowhere else.

En Español

El Monte Bonnell (785 pies sobre el nivel del mar y 300 pies sobre el lago Austin) domina **la Escarpa de Balcones** y ofrece un panorama del centro de Austin hacia el este y los bordes erosionados del **Edwards Platueau** hacia el oeste.

Visit the **Texas GeoSign** website to view the English and Spanish-language versions of this sign. http://www.beg.utexas.edu/geosign.

Visite el sitio web de **Texas GeoSign** para ver las versiones en Inglés y Español de este letrero. http://www.beg.utexas.edu/geosign.

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