U.S. Department of the Interior
U.S. Geological Survey

Prepared in cooperation with the
Edwards Aquifer Authority

Scientific Investigations Map 3518
Pamphlet accompanies map

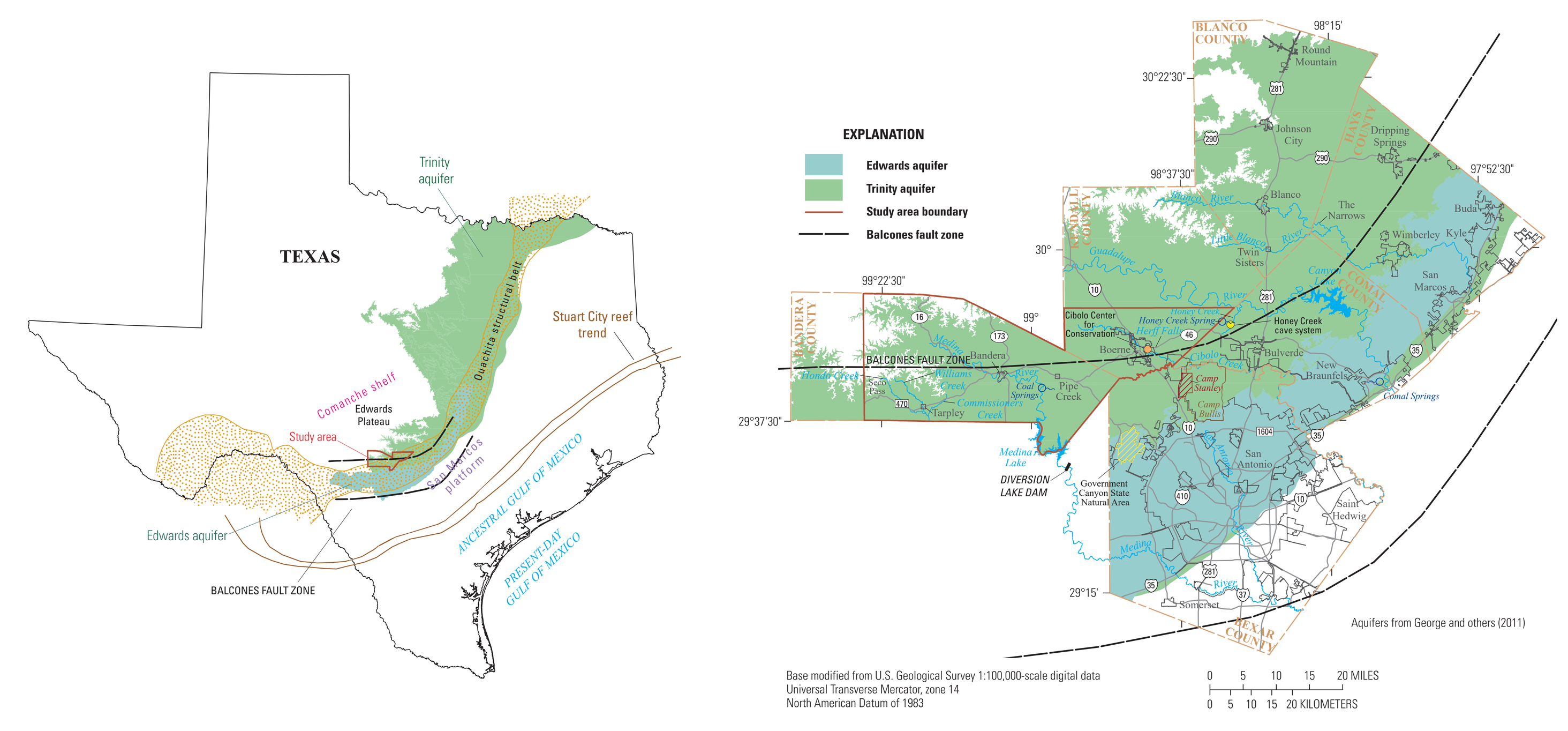


Figure 1. Location of the study area relative to the State of Texas, Bandera and Kendall Counties, the surficial extent of the rocks that contain the Edwards and Trinity aquifers, and the surficial extent of the Balcones fault zone (modified from fig. 2 in Barker and Ardis [1996]).

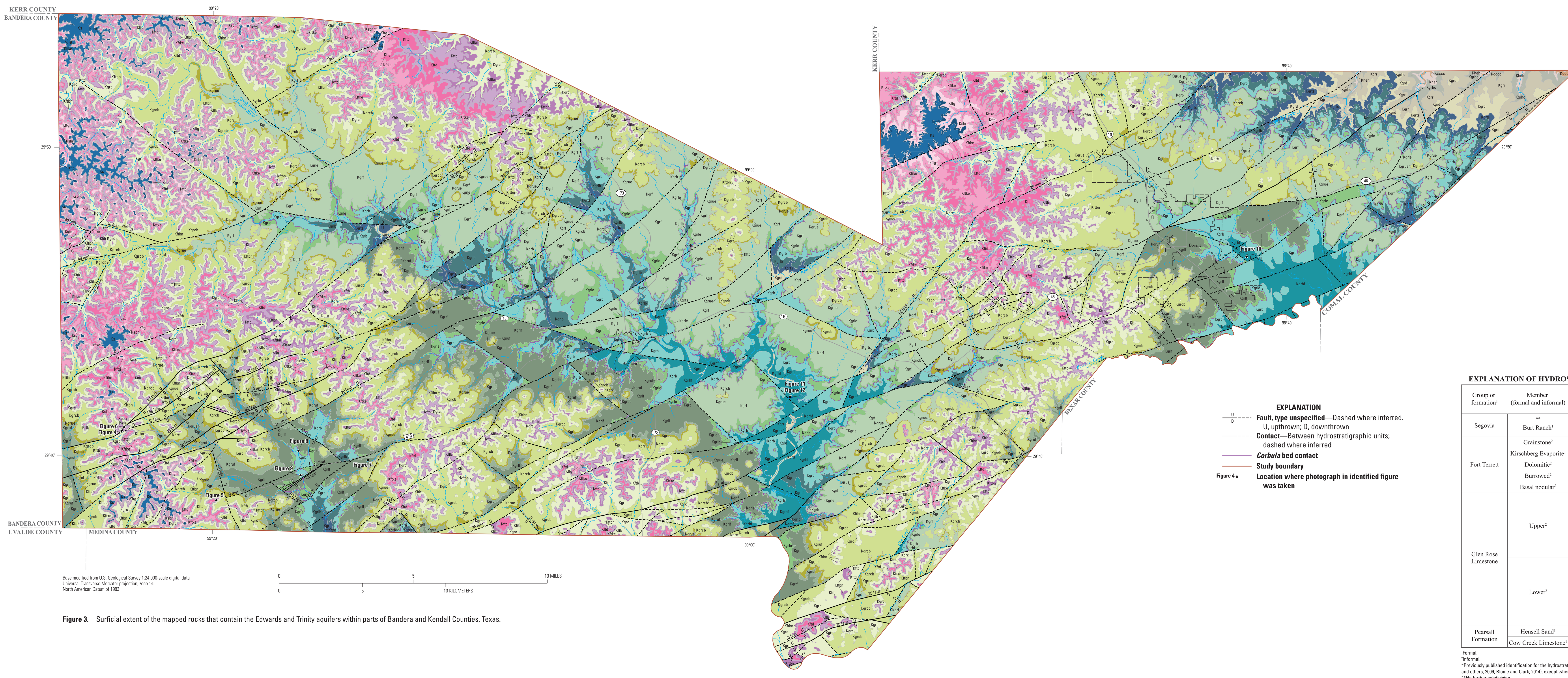


Figure 3. Surficial extent of the mapped rocks that contain the Edwards and Trinity aquifers within parts of Bandera and Kendall Counties, Texas.

EXPLANATION

Fault, type unspecified—Dashed where inferred. U, upthrown; D, downthrown

Contact—Between hydrostratigraphic units; dashed where inferred

***Corbula* bed contact**

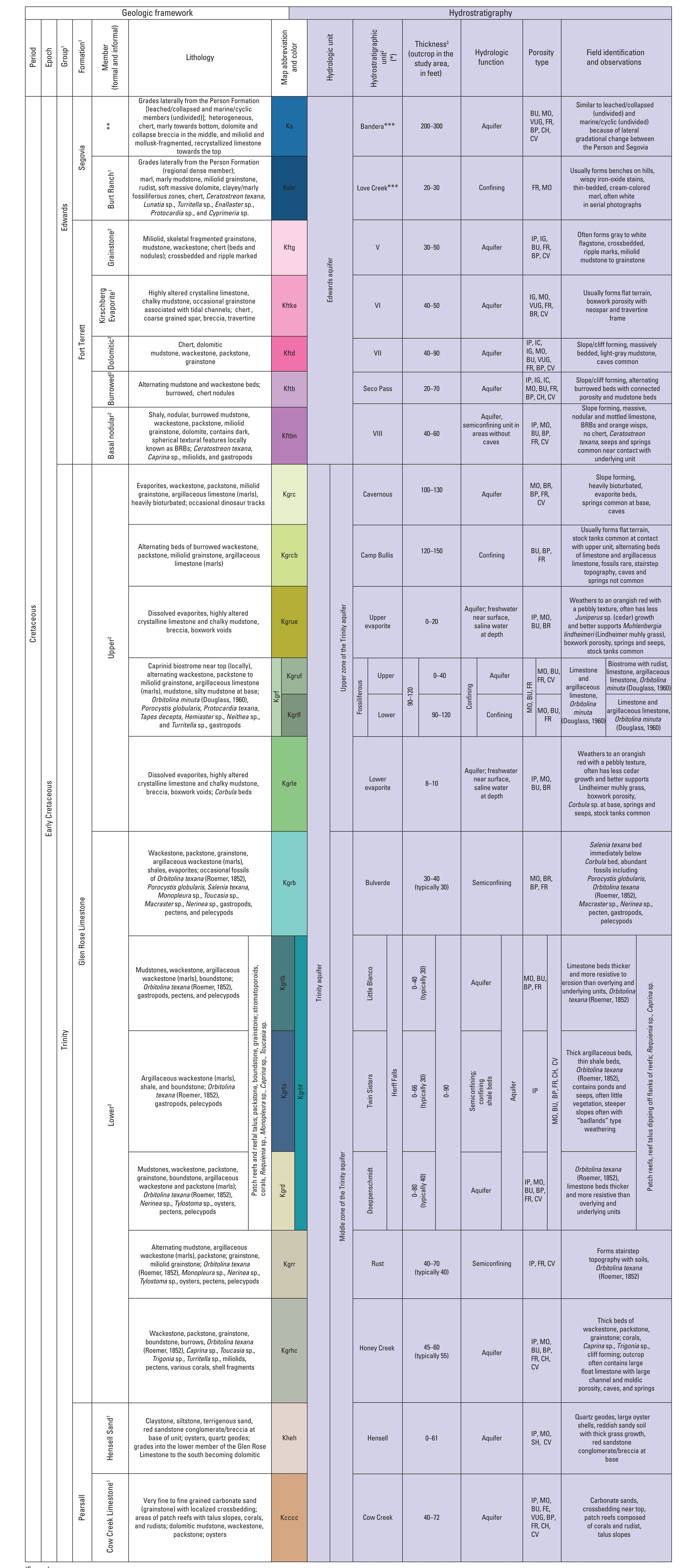
Study boundary

Figure 4 ● **Location where photograph in identified figure was taken**

EXPLANATION OF HYDROSTRATIGRAPHIC UNITS

Group or formation[1]	Member (formal and informal)		Hydrologic unit or informal hydrostratigraphic unit*
Segovia	**	Ks	Bandera***
	Burt Ranch[1]	Ksbr	Love Creek***
Fort Terrett	Grainstone[2]	Kftg	V
	Kirschberg Evaporite[1]	Kftke	VI
	Dolomitic[2]	Kftd	VII
	Burrowed[2]	Kftb	Seco Pass
	Basal nodular[2]	Kftbn	VIII
Glen Rose Limestone	Upper[2]	Kgrc	Cavernous
		Kgrcb	Camp Bullis
		Kgrue	Upper evaporite
		Kgrf: Kgruf	Fossiliferous: Upper
		Kgrf: Kgrlf	Fossiliferous: Lower
		Kgrle	Lower evaporite
	Lower[2]	Kgrb	Bulverde
		Kgrhf: Kgrlb	Herff Falls: Little Blanco
		Kgrhf: Kgrts	Herff Falls: Twin Sisters
		Kgrhf: Kgrd	Herff Falls: Doeppenschmidt
		Kgrr	Rust
		Kgrhc	Honey Creek
Pearsall Formation	Hensell Sand[1]	Kheh	Hensell
	Cow Creek Limestone[1]	Kcccc	Cow Creek

[1]Formal.
[2]Informal.
*Previously published identification for the hydrostratigraphic unit (Maclay and Small, 1976; Clark and others, 2009; Blome and Clark, 2014), except where otherwise noted.
**No further subdivision.
***Informal hydrostratigraphic unit name that has not been published previously.



[1]Formal.
[2]Informal.
[3]Thickness range based on field mapping.
*Previously published identification for the hydrostratigraphic unit (Maclay and Small, 1976; Clark and others, 2009; Blome and Clark, 2014), except where otherwise noted.
**No further subdivision.
***Informal hydrostratigraphic unit name that has not been published previously.

Figure 2. Summary of the geologic framework and hydrostratigraphy of the Edwards and Trinity aquifers within parts of Bandera and Kendall Counties, Texas. Chart modified from Clark and others (2016a, b, 2018, 2020). Period, Epoch, group, formation, members, and lithology modified from Imlay (1945), Whitney (1952), Lozo and Stricklin (1956), Stricklin and others (1971), Rose (1972), Amsbury (1974), Clark and others (2009), Wierman and others (2010), Clark and others (2014), Blome and Clark (2014), U.S. Geological Survey (2022); *Orbitolina minuta* (Douglass, 1960), *Orbitolina texana* (Roemer, 1852), Loucks and Kerans (2003); aquifers from Maclay and Small (1976), Ashworth (1983); hydrostratigraphic units from Rose (1972), Maclay and Small (1976), Stein and Ozuna (1995), Clark (2003, 2004), Clark and others (2009), Blome and Clark (2014), Wierman and others (2010), Clark and others (2014, 2023); hydrogeologic function modified from outcrop, Clark and others (2009), Wierman and others (2010), Clark and others (2014), Clark and Morris (2015); listed thicknesses are from outcrop measurements. Porosity types adapted from Choquette and Pray (1970): Fabric selective: IP, interparticle porosity; IG, intergranular porosity; IC, intercrystalline porosity; SH, shelter porosity; MO, moldic porosity; BU, burrow porosity; FE, fenestral porosity; BP, bedding plane porosity. Non-fabric selective: FR, fracture porosity; CH, channel porosity; BR, breccia porosity; VUG, vug porosity; CV, cave porosity. BRBs, black rotund bodies.

Figure 4. High-angle fault juxtaposing the Glen Rose Limestone of the Trinity Group (left side of photograph) against the basal nodular member (right side of photograph) of the Fort Terrett Formation along Highway 470, Bandera County, Texas (fig. 1) (lat 29°40'49" N., long 99°23'23" W.; photograph by Allan K. Clark, U.S. Geological Survey, December 17, 2021).

Figure 5. Appreciable fracture with lateral separation in the burrowed member of the Fort Terrett Formation south of Highway 470, Bandera County, Texas (fig. 1) (lat 29°38'37" N., long 99°19'48" W.; photograph by Allan K. Clark, U.S. Geological Survey, January 1, 2022).

Figure 6. Open burrows within the Seco Pass hydrostratigraphic unit of the Edwards aquifer, Seco Pass, Bandera County, Texas (fig. 1) (lat 29°40'56" N., long 99°23'17" W.; photograph by Allan K. Clark, U.S. Geological Survey, December 12, 2021).

Figure 7. Pond created by dammed springflow from the lower evaporite hydrostratigraphic unit along Commissioners Creek near Tarpley, Bandera County, Texas (fig. 1) (lat 29°39'19" N., long 99°15'18" W.; photograph by Allan K. Clark, U.S. Geological Survey, October 27, 2021).

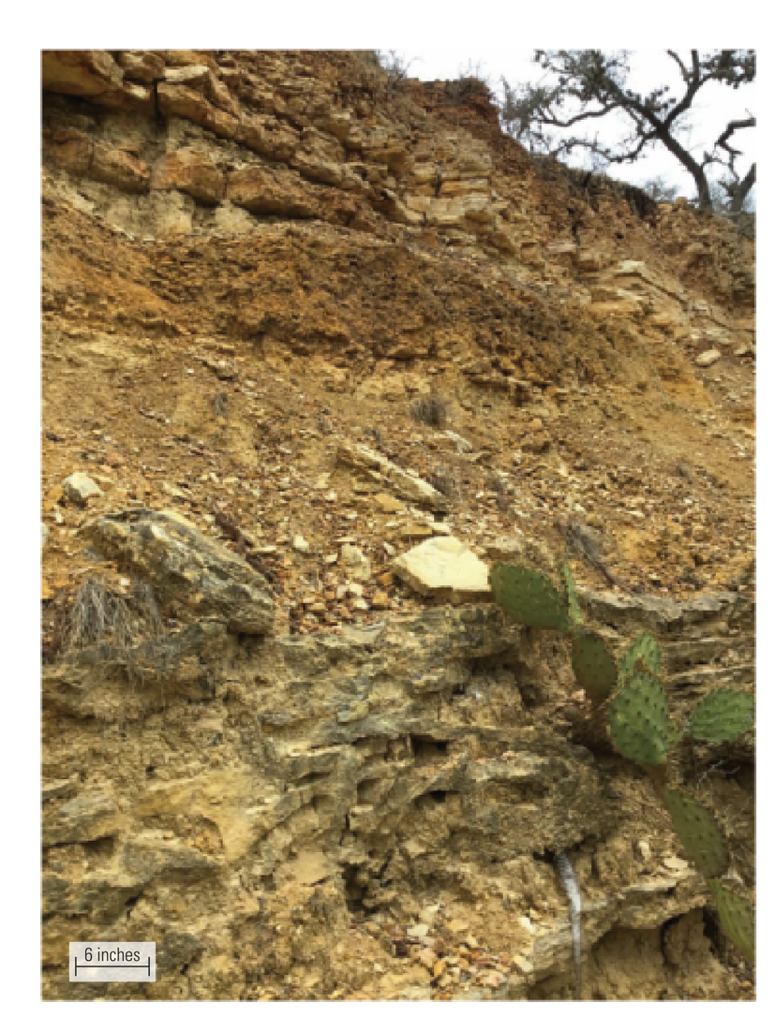


Figure 8. Boxwork porosity in the lower evaporite hydrostratigraphic unit of the upper zone of the Trinity aquifer, located in Williams Creek north of Tarpley, Bandera County, Texas (fig. 1) (lat 29°40'12" N., long 99°16'48" W.; photograph by Allan K. Clark, U.S. Geological Survey, March 22, 2022).

Figure 9. Outcrop of the Bulverde hydrostratigraphic unit in the middle zone of the Trinity aquifer, Tarpley, Bandera County, Texas (fig. 1) (lat 29°39'24" N., long 99°16'44" W.; photograph by Allan K. Clark, U.S. Geological Survey, April 26, 2022).

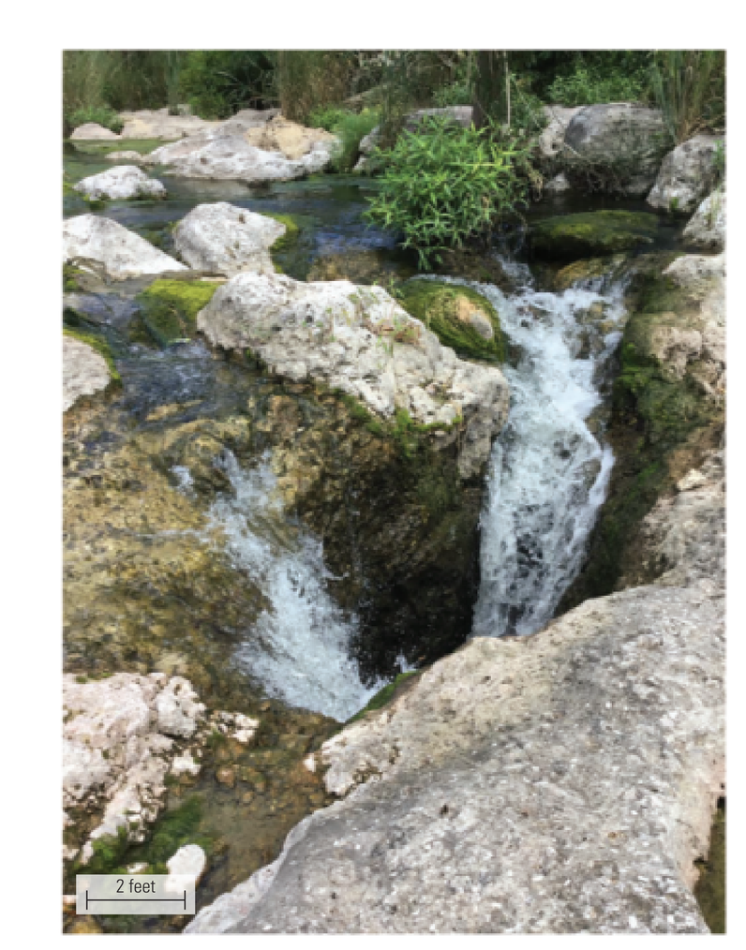


Figure 10. Entire base flow of Cibolo Creek entering sinkhole in the Herff Falls hydrostratigraphic unit of the middle zone of the Trinity aquifer, Cibolo Center for Conservation, Boerne, Kendall County, Texas (fig. 1) (lat 29°46'29" N., long 98°41'31" W.; photograph by Allan K. Clark, U.S. Geological Survey, May 5, 2021).

Figure 11. Medina River and water issuing from the Herff Falls hydrostratigraphic unit of the middle zone of the Trinity aquifer through Coal Springs, Bandera County, Texas (fig. 1) (lat 29°41'57" N., long 98°58'31" W.; photograph by Allan K. Clark, U.S. Geological Survey, May 5, 2021).

Figure 12. Moldic porosity associated with corals and rudists in the Herff Falls hydrostratigraphic unit of the middle zone of the Trinity aquifer adjacent to the Medina River near Coal Springs, Bandera County, Texas (fig. 1) (lat 29°41'57" N., long 98°58'31" W.; photograph by Allan K. Clark, U.S. Geological Survey, May 5, 2021).

Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers Within Parts of Bandera and Kendall Counties, Texas

By

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2024

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