

“Riparian Boundaries In Texas”

presented by

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I. Introduction.

This final paper shifts focus from the Texas shoreline to Texas rivers. The Texas Parks and Wildlife Department reports there are fifteen rivers and an additional 3,700 named streams that flow through thousands of miles of Texas land.¹ As described in greater detail below, the State of Texas owns the “beds” of navigable rivers and streams, but most of the land lying along Texas rivers and streams, *i.e.*, *riparian* land, is privately owned. This paper summarizes the current Texas law governing how to survey the boundary line between state-owned riverbeds and the abutting private land.²

The most recent Texas Supreme Court opinion on the subject is *Brainard v. State*, 12 S.W.3d 6 (Tex. 1999), which established riparian boundaries along both sides of approximately thirty miles of the Canadian River in the Panhandle. This paper relies heavily on Justice Hankinson’s comprehensive, unanimous opinion for the Court in *Brainard*.³ In *Brainard*, the Texas Supreme Court reaffirmed that the boundaries between state-owned riverbeds and privately-owned riparian land lie along the banks of rivers on a line called the “gradient boundary.” 12 S.W.3d at 15-16. Thus, in Texas, the gradient boundary marks the line between state-owned and private land along rivers, in the same manner as mean higher tide or mean higher high tide lines mark that boundary on the seashore.

The critical aspects of Texas riparian boundary law may be broken down into the following subtopics, each of which will be discussed below:

- (1) What is the state’s “riverbed?”
- (2) Where are the river’s “banks” that mark the boundary of the riverbed?
- (3) Marking riparian boundaries—the “gradient boundary.”
- (4) The ever-changing boundary—erosion, accretion, reliction.
- (5) Artificial, or man-induced, erosion, accretion, or reliction
- (6) Changes that do not shift the boundary—avulsion and subsidence.

¹See the Department’s website, *Texas River Guide*: <http://www.tpwd.state.tx.us/texaswater/rivers/>.

²Riparian boundaries ordinarily are surveyed by licensed state land surveyors, who are licensed to survey land in which the state or the Texas Permanent School Fund has an interest, as well as to file field notes in the Texas General Land Office. Tex. Occ. Code §§ 1071.002(5), 1071.354 & 1071.355 (Vernon 2004).

³The author was one of the lawyers who represented the riparian landowners in *Brainard*. He briefed and argued the case for the landowners in the Supreme Court of Texas. The author also submitted *amicus* briefs to the Supreme Court on behalf of King Ranch in *John G. and Marie Stella Kenedy Memorial Foundation v. Dewhurst*, 90 S.W.3d 268 (Tex. 2002).

II. The State's Riverbed.

The State of Texas owns the beds of navigable rivers and streams. TEX. PARKS & WILD. CODE § 1.011(c) (Vernon 2002); *Brainard*, 12 S.W.3d at 15 n.3. The Texas Supreme Court has held that the lands underlying navigable waters are “held in trust by the state for the use and benefit of all the people.” *State v. Bradford*, 50 S.W.2d 1065, 1069 (Tex. 1932). The question whether a stream is navigable, for state law purposes, is often resolved by the “30 Foot Statute,” which provides that a navigable stream is “a stream which retains an average width of 30 feet from the mouth up.” TEX. NAT. RES. CODE § 21.001(3) (Vernon 2001); *Brainard*, 12 S.W.3d at 16 n.4. It is unlawful for a survey to cross a navigable stream in Texas since the bed of the stream belongs to the state. TEX. NAT. RES. CODE § 21.012 (Vernon 2001).⁴

In *Brainard*, the Texas Supreme Court defined the features of the state's riverbed by quoting from prior judicial opinions as follows:

The bed of a stream is that portion of its soil which is alternatively covered and left bare as there may be an increase or diminution in the supply of water, and which is adequate to contain it at its average and mean stage during an entire year, without reference to the extra freshets of the winter or spring or the extreme drouths of the summer or autumn.

* * *

When we speak of the bed we include all of the area which is kept practically bare of vegetation by the wash of the waters of the river from year to year in their onward course, although parts of it are left dry for months at a time, and we exclude the lateral valleys which have the characteristics of relatively fast land and usually are covered by upland grasses and vegetation, although temporarily overflowed in exceptional instances when the river is at flood.

Brainard, 12 S.W.3d at 16-17.⁵ These definitions establish that the state's riverbed does not include broad expanses of land sometimes referred to as the river's floodplain, or the river's valley, which is inundated only during flood events.

Otherwise, the definitions are not very precise, and it may become important to locate the boundaries of a state-owned riverbed on the surface of the earth. It is common for boundary descriptions in legal documents to include calls such as “to the river,” “to the banks of the river,” “along the river,” “following the bank of the river,” “with the meanders of the river,” or something similar. Such descriptions establish the gradient boundary

⁴The “30 Foot Statute” and the additional language prohibiting surveys from crossing navigable streams were enacted by the Republic of Texas in 1837, and those statutes have remained part of Texas law since that time. See Act approved Dec. 14, 1837, § 42, reprinted in 1 H.P.N. Gammel, THE LAWS OF TEXAS 1822-1897 at 1404, 1418 (Austin, Gammel Book Co. 1898). In parts of the state, however, early surveyors did not get the message and the state conveyed into private hands some patents and deeds of acquittance that crossed and therefore encompassed riverbeds. The Legislature validated certain of these early conveyances by the “Small Act,” codified at TEX. REV. CIV. STAT. ANN. arts. 5414a & 5414a-1 (Vernon 1962). See *State v. Bradford*, 50 S.W.2d at 1071-80 (holding, *inter alia*, that the Legislature has power to grant riverbed land into private ownership). As a result, there is private ownership of riverbed land in some places in the state.

On the Small Act and related issues, see generally 3 Fred A. Lange & Aloysius A. Leopold, TEXAS PRACTICE: LAND TITLES AND TITLE EXAMINATION § 176 (West 2d ed. 1992); Kenneth Roberts, *Title and Boundary Problems Relating to Riverbeds*, 36 TEXAS L. REV. 299, 304-06 (1958). For an excellent summary of the history and derivation of Texas riparian and littoral law, see Shannon H. Ratliff, *Shoreline Boundaries, Part I: Legal Principles*, Texas Coastal Law Conference, May 19-20, 2005.

⁵Both quotations came from *Oklahoma v. Texas*, 260 U.S. 606, 631-32 (1924). The Texas Supreme Court earlier had quoted the first paragraph in *Motl v. Boyd*, 286 S.W. 458, 467 (Tex. 1926).

between the state's riverbed and privately owned land, which boundary will lie on and along the river's banks, as the physical boundary of the property being described.⁶ As the Texas Supreme Court stated in *Brainard*, the precise definition of a particular river's bed is that land lying between properly marked gradient boundary lines along both sides of the river. *Brainard*, 12 S.W.3d at 16.

Modern land use often creates other reasons for marking the boundary between the state's riverbed and private riparian lands. For example, the mineral estate under riverbeds and channels belongs to the Permanent School Fund. TEX. NAT. RES. CODE §§ 11.041(a)(1), 51.011 (Vernon 2001). The Commissioner of the General Land Office leases riverbeds for oil and gas development. See TEX. NAT. RES. CODE § 52.071 (Vernon 2001).⁷ Mineral lessees need to know the boundaries of their leasehold. It is not a good idea for the state's lessee to drill wells on private riparian lands, or for riparians' lessees to drill wells in the riverbed.

As another example, the state can and will sue riparian landowners for damages and injunctive relief for trespassing on the state's riverbed. See, e.g., *State v. Riemer*, 94 S.W.3d 103, 104-05 (Tex. App.—Amarillo 2002, no pet.). One factor that precipitated the *Brainard* litigation was extensive public recreational use for hunting, exploring, and camping of the wide expanse of land up and down the Canadian River the state claimed as its riverbed. The riparian owners argued that the state's riverbed was only twenty to fifty feet wide and that the public was trespassing on privately-owned land. Since the boundary was disputed, the riparians were unable to obtain assistance from law enforcement.

III. The Boundary Banks of the River

Rivers may have more than one set of banks. There are the bluffs at the edge of a river's valley. There are flood banks, or vestiges of banks left as floods pushed out over a river's flood plain and then receded. There are the water-washed banks that serve to confine the flow of the river's water at its ordinary and mean stage.

The basic dispute in *Brainard* turned on which set of banks were the proper banks for marking the boundary between public and private ownership along the Canadian. The state contended that the proper banks for marking the boundary were the "historic" banks of the Canadian, formed when floods coursed down the river before 1965, when the federal and state governments dammed the river approximately fourteen miles upstream. The state's legal argument (discussed in greater detail below) was that manmade changes induced in the river, such as changes wrought by the construction of a dam upstream, could not divest the state of title to land. The riparians contended the proper banks for confining the state's riverbeds were those that *currently* confined the waters of the river during its ordinary stages of flow, not flood banks lying in the flood plain that had never been water-washed after the dam was closed except perhaps very rarely during extremely heavy rains.

In *Brainard* and earlier cases, the Texas Supreme Court adopted the following definition of the proper bank along which the gradient boundary lies:

⁶See, e.g., *Stover v. Gilbert*, 247 S.W. 841, 843 (Tex. 1923); *Allen v. Morales*, 665 S.W.2d 851, 852-53 (Tex. App.—Fort Worth 1984, no writ.). Meander lines depicted on a survey "are not run as boundaries of the tract surveyed . . . the purpose of meander lines being merely for the benefit of the Government in ascertaining the quantity of land in the survey for which it requires payment." *McCombs v. McKaughan*, 195 S.W.2d 194, 199 (Tex. Civ. App.—Beaumont 1946, writ ref'd).

⁷See generally 3 Fred A. Lange & Aloysius A. Leopold, *supra* n. 4 at § 175 pp. 287-88; Comment, 31 TEXAS L. REV. 312, 320 (1953) (stating "[p]resent leases of these beds by the School Land Board do not contain an exact description of the land covered; instead a map of the present bed is attached with brackets shown on the river to show the area included. The lease reads that the state leases its interests within these lines.").

. . . the water-washed and relatively permanent elevation or acclivity at the outer line of the river bed which separates the bed from the adjacent upland, whether valley or hill, and serves to confine the waters within the bed and to preserve the course of the river

Brainard, 12 S.W.3d at 16.⁸

IV. The Gradient Boundary

A. Historical Development of the Gradient Boundary.

The concept of the gradient boundary was developed during litigation in the United States Supreme Court to mark the boundary between Texas and Oklahoma on the Red River. See *Oklahoma v. Texas*, 260 U.S. 606 (1923) (opinion); 261 U.S. 340 (1923) (partial decree setting out orders for marking the boundary); 265 U.S. 493 (1924) (report of boundary commissioners); 265 U.S. 500 (1924) (decree approving report of boundary commissioners).⁹ The “father” of the gradient boundary was Colonel Arthur A. Stiles, a distinguished civil engineer employed by the State of Texas during the *Oklahoma v. Texas* litigation. The United States Supreme Court appointed Colonel Stiles as one of the boundary commissioners for that litigation. Years later, Stiles published an important article describing the proper method for marking the gradient boundary. Arthur A. Stiles, *The Gradient-Boundary—the Line Between Texas and Oklahoma Along the Red River*, 30 TEXAS L. REV. 305 (1952) (hereinafter the “Stiles Article”). The gradient boundary is sometimes referred to as the “Stiles method.”

In *Oklahoma v. Texas*, the federal Supreme Court held that under the governing historical treaty between the United States and Spain, the boundary of Texas lies along the south bank of the Red River, not in the middle of the river as claimed by Texas. 256 U.S. 70 (1921). The Court then adopted Stiles’ gradient boundary as the proper procedure for marking the Texas boundary along the Red River’s south bank. When the Texas Supreme Court later needed to determine how to mark boundary lines between the state’s riverbeds and private riparian lands, it adopted the gradient boundary from *Oklahoma v. Texas*, a decision it has since reaffirmed several times. See *Brainard*, 12 S.W.3d at 15-16.¹⁰

B. Marking the Gradient Boundary.

The literature provides several descriptions of how to mark the gradient boundary.¹¹ They may be summarized as follows:

► **Step (1):** The original elevation of the boundary is marked on the lowest qualified bank in the vicinity, called the “key bank,” at the point on that bank halfway between the low water level, when the flowing water first reaches the bank, and the high water level, when the

⁸Again quoting *Oklahoma v. Texas*, 260 U.S. at 631-32.

⁹There is a brief history of the boundary dispute between Texas and Oklahoma that gave rise to *Oklahoma v. Texas* in John W. Hammett, *The Oklahoma-Texas Boundary Dispute*, 26 OKLA. BAR J. 1858 (1955).

¹⁰See *Maufrais v. State*, 180 S.W.2d 144, 147-48 (Tex. 1944); *Diversion Lake Club v. Heath*, 86 S.W.2d 441, 446 (Tex. 1935); *Mott v. Boyd*, 286 S.W. 458, 467-68 (Tex. 1926). In the forward to the Stiles Article, Justice Graham B. Smedley of the Texas Supreme Court wrote that the gradient boundary “was adopted by the Supreme Court of Texas in *Mott v. Boyd*, and has been applied in later decisions as the law of Texas for marking the line between public and private ownership along streams, the beds of which are owned by the state.” Stiles Article pp. 305-06.

¹¹See, e.g., *Brainard*, 12 S.W.3d at 26; *Oklahoma v. Texas*, 265 U.S. at 496-97; Stiles Article at 315-21; Wallace Hawkins, *Title to River Beds in Texas and Their Boundaries*, 7 TEXAS L.REV. 493, 503-05 (1929).

flowing water just reaches the top of that bank without overflowing it. Colonel Stiles referred to this point on the key bank as a bench mark. Stiles Article pp. 317.

► **Step (2):** At the elevation of the bench mark, the boundary line then follows the gradient (or rate of fall) of the flowing water in the river. It is helpful to imagine a plane lying at the bench-marked elevation that declines in elevation at the same rate as the fall of the flowing water in the river. The boundary line lies along the edge of that imaginary plane as the plane intersects banks and other features along the side of the river. *Id.*¹²

Colonel Stiles provided the following helpful illustration of the gradient boundary by focusing on the rare occasion when the water in the river will be flowing at the exact same elevation as the benchmark on the key bank:

When the surface of the flowing water in the river and the elevation of the boundary coincide, the boundary is on the ground at the feather-edge of the water, and stakes driven there will mark the perfect gradient and the perfect boundary—hence the name, “gradient boundary.”

Stiles Article p. 310. Stiles also summarized: “In short, the height and position of the gradient boundary are fixed by the bank of the river; the grade is fixed by the surface of the water in the river; and the course is fixed by the topography along the river.” *Id.* Accordingly, the actual level of the water in the river at any given time has no effect on the gradient boundary. The water establishes only the rate of fall of the boundary. The boundary’s elevation is fixed at the bench mark, which is the midpoint of the lowest qualified, or key, bank.

Step (1), locating the key bank, is the most difficult and demanding part of a gradient boundary survey. It requires training and experience beyond that of most land surveyors. As Colonel Stiles wrote:

Finding the one correct bank in the vicinity that locates the gradient boundary upon the ground is no casual undertaking. If this bank is wrong, the whole boundary is wrong on both sides of the river. Once established, the gradient boundary permits no subsequent “corrections” or “adjustments” in the line. The boundary is either right or it is wrong in the first instance, depending on the correctness of this one lowest bank which is the basis of the gradient boundary.

Stiles Article p. 315.

Stiles provided the following guidance for selecting the key bank:

The bank intended is water-washed and relatively permanent. * * *

The bank being looked for is at the outer line of the river bed. In almost every case it is an accretion bank, and, although both sides of the river should be examined, it is seldom an erosion or “cut bank.” As a rule the bank will be found on the side of the river where accretion is generally in progress. Of any two banks otherwise equally fulfilling the requirements of the court, the lower bank must be accepted as correct. This series of positive eliminations lead but downward and ultimately to the lowest qualified bank in the vicinity, the bank being sought.

¹²See *Brainard*, 12 S.W.3d at 26-27.

Stiles Article pp. 316-17.¹³ One author has stated “the gradient boundary is a low boundary, giving a maximum amount of land to riparian owners and a minimum amount to the state.”¹⁴ Flood banks are not proper banks for marking the gradient boundary. *Brainard*, 12 S.W.3d at 26.

To Stiles, gradient boundary surveying meant “hard work on foot on the river.” Stiles Article p. 316. Stiles taught that surveyors could find the key bank only by “close study in walking the banks, not by inspection from a distance, from the air, from across the river, or from a few isolated places most easily reached in an automobile.” *Id.* Stiles warned:

No intelligent idea of the river can be had from survey diagrams, aerial photographs, or contour sketches made from them and examined in some office. Such procedure results in superficial knowledge, false impressions, wrong conclusions, and bad work.

Id.

After the surveyor selects the key bank and marks the midpoint elevation (the “bench mark”), Stiles described the process for extending the gradient boundary up or down river as follows:

The level is the only surveying instrument with which the gradient boundary can be located upon the ground. The boundary line cannot be projected. It goes where the level leads; the surveyor follows. The level gives him little discretion and no choice in locating the boundary. To a marked degree, the correct location of the boundary is beyond surmise, doubt, approximation, or bias. Each stake set on the gradient boundary represents a separate operation in surveying. Every stake is independent of every other stake. Hence, there are no circuits to be closed, nothing to be balanced, and no random or trial lines to be run.

Stiles Article p. 311.

The elevation established by the surveyor’s level likely will encounter different topographical features as it is located along the river’s bank. Stiles wrote: “The boundary bank is an erosion bank here; an accretion bank there; and a transverse slope yonder. The boundary bank is determined by the relative height of the bank, not by its form, condition, or name.” Stiles Article p. 313; see *Brainard*, 12 S.W.3d at 26.

As the topography of the river changes from place to place, the surveyor may need to identify a closer key bank and determine again the river’s rate of fall. In *Oklahoma v. Texas*, the United States Supreme Court noted with approval that the gradients utilized by the boundary commissioners “were not unbroken lines arbitrarily projected from one end of the Big Bend Area [of the Red River] to the other, but were broken lines adjusted to prevailing levels in relatively short sections.” 265 U.S. at 497-98. Stiles’ article states that the gradient boundary should be located on one side of the river at a time. Stiles Article p. 320.

After the gradient boundary is staked at various points along the river, “the line may be meandered in the usual way with the usual instruments.” Stiles Article p. 320. The final judgment entered in *Brainard*, which the Texas Supreme Court affirmed as marking the correct gradient boundary, contained over sixty single-spaced pages of courses and distances along both sides of the Canadian River in the surveyed area.¹⁵

¹³Stiles provides the heights of qualified banks and their midpoint “bench marks” for locations on several rivers. The banks range from 2.2 to 3.22 feet, with the benchmarks being at elevations half of the bank heights and therefore ranging from 1.1 to 1.6 feet. Stiles Article p. 317 n. 4.

¹⁴Kenneth Roberts, *supra* n. 4 at 310.

¹⁵See Final Judgment in Cause No. 6,354, filed April 1, 1996, in the 100th District Court, Collingsworth County, Texas.

V. The Ever-Changing River—Erosion, Accretion, and Reliction.

The gradient boundary will move and shift in accordance with erosion, accretion, and reliction along the river's banks resulting from the action of the flowing water.¹⁶ The Texas Supreme Court explained in *Brainard*:

Texas follows the general rule that when the location of the margin or bed of a body of water that constitutes the boundary of a tract is gradually and imperceptibly changed or shifted by accretion, reliction, or erosion, the margin or bed of the body of water, as so changed, remains the boundary line of the tract, which is extended or restricted accordingly.

12 S.W.3d at 17-18.

Indeed, Texas courts have described the ownership interest of the riparian owner as “a base fee, determinable upon the occupancy of his soil by the river,” and the title of the state as “likewise a base or qualified fee, determinable in favor of the riparian upon the abandonment of the bed by the river.”¹⁷ The Court reaffirmed in *Brainard* that a riparian owner's right to gain land added by accretion or reliction is a vested property right. 12 S.W.3d at 18; *accord, Manry v. Robison*, 56 S.W.2d 438, 444 (Tex. 1932).

The *Brainard* opinion describes the three natural processes that result gradually and imperceptibly from the action of the water as follows:

▶ “Erosion” is the process of wearing away the land. A riparian owner ordinarily loses title to land lost by erosion. *Brainard*, 12 S.W.3d at 17.

▶ “Accretion” is the process of increasing real estate by the gradual and imperceptible disposition by water of solid material” Accretion by alluvion is the gradual addition made to land by the washing of the water. “Alluvion” is the solid material, such as mud, deposited by the river. Riparian owners acquire title to additions or extensions accreted to their land. *Id.* at 17-18.

▶ “Reliction” (sometimes “dereliction”) is the uncovering of previously submerged land by a permanent rescission of a body of water, rather than a mere temporary or seasonal exposure of the land. Riparian owners also gain land uncovered by reliction. *Id.*¹⁸

There are several rationales for the law's application of the rules of erosion, accretion, and reliction. In *Brainard*, the Texas Supreme Court said “perhaps the most important reason” is the need to preserve the riparian quality of privately-owned upland. 13 S.W.3d at 18. In other words, the Court believed the boundary between public and private land must move with the action of the water in the river to make sure the private land continues

¹⁶In this respect, river boundaries are like seashore boundaries. *See, e.g., State v. Balli*, 190 S.W.2d 71, 99-101 (Tex. 1944); *Natland Corp. v. Baker's Port, Inc.*, 865 S.W.2d 52, 57 (Tex. App.—Corpus Christi 1993, writ denied) (shoreline boundary). The Texas Supreme Court discussed several parts of the *Natland* opinion with approval in *Brainard*. *See* 12 S.W.3d at 20-22.

¹⁷*State v. R. E. Janes Gravel Co.*, 175 S.W.2d 739, 741 (Tex. Civ. App.—Austin 1943), *rev'd in part on other grounds sub nom. Maufrais v. State*, 180 S.W.2d 144 (Tex. 1944). The description of the riparian's interest as “a base fee, determinable upon the occupancy of his soil by the river,” appeared in Texas jurisprudence in *Manry v. Robison*, 56 S.W.2d 438, 445 (Tex. 1932), and was criticized shortly thereafter in Comment, 12 TEXAS L. REV. 490 (1934).

¹⁸*See generally* Carol Eggert Dinkins, *Texas Seashore Boundary Law: The Effect of Natural and Artificial Modifications*, 10 HOUS. L. REV. 43, 46-59 (1972); Kenneth Roberts, *supra* n. 4 at 318-20; Comment, 31 TEXAS L. REV. 312, 315 (1953).

to abut, and have access in all places to, the water, which is what gives the land its valuable riparian character.¹⁹ The other rationales mentioned in *Brainard* are: (1) the Roman legal theory of accession, which holds that as the owner of a tree owns the fruit of the tree, the owner of riparian land owns accreted land, (2) the need to continue using the river, as it may exist from time to time, as the actual boundary between public and private land,²⁰ (3) a notion that the volume of land added by accretion is likely to be too trifling for the law to be concerned about, (4) a belief that the law should favor productive use of land and riparian landowners are more likely than the state to put accreted land to productive use, and (5) a theory of fairness, which states that because riparian owners lose land from erosion, they ought to gain from land added by accretion or reliction. 12 S.W.3d at 18.²¹

Two Texas Courts of Appeals have confirmed that the traditional rules of erosion, accretion, and reliction apply to severed mineral estates, just as they apply to the surface. *Siegert v. Seneca Resources Corp.*, 28 S.W.3d 680, 684 (Tex. App.—Corpus Christi 2000, no pet.); *Ely v. Briley*, 959 S.W.2d 723, 726-27 (Tex. App.—Austin 1998, no pet.). Accord 9 Richard A. Powell, POWELL ON REAL PROPERTY ¶ 66.04[2] (Michael A. Wolf, ed., 2005).

VI. Artificial or Man-Induced Erosion, Accretion, and Reliction.

The principal issue the Texas Supreme Court decided in *Brainard* was whether the traditional rules of accretion and reliction apply when the changes in a river result from, or are induced by, human activity. The alleged “artificial change” in *Brainard* was the construction and closing of Sanford Dam on the Canadian River by governmental authorities approximately thirty years earlier. The state agency that operates Sanford Dam had not released water through the dam since the dam was closed in 1965. *Brainard*, 12 S.W.3d at 11. Because of the dam, major floods of the type that used to course downstream from time to time no longer occurred, the river flowed in a relatively stable channel, and the sandy soil along the flowing water of the river grew up with large trees and other permanent vegetation. In *Brainard*, the state claimed a “riverbed” approximately 3400 feet wide. The riparian landowners contended the state’s riverbed ranged only from twenty to fifty feet wide. 12 S.W.3d at 12.

The Supreme Court described the state’s “artificial change” theory as follows: “any change in the boundary of the Canadian River that is caused by human activities does not divest the State of title to the bed of the Canadian River as it existed in its unaffected condition.” *Id.* at 14. In effect, the state argued that upon the closing of Sanford Dam, the boundaries of the Canadian in the disputed area were frozen in time as they were prior to the dam. The Court rejected the state’s artificial change theory, holding:

When the processes of accretion, reliction and erosion are initiated, accelerated, or otherwise influenced by artificial structures, the usual rule that a riparian owner receives title to new lands formed as a result of those processes is not affected.

¹⁹In *Hollan v. State*, 308 S.W.2d 122, 125 (Tex. Civ. App.—Fort Worth 1957, writ ref’d n.r.e.), the court noted that the riparian owner’s “right of access attaches equally to the whole and every part of his shore line, and no one has the right to fetter or impair his enjoyment of his property by compelling him to go upon it only at certain points.” See also *Brainard*, 12 S.W.3d at 15 n. 2 (“A riparian owner . . . is one whose land is bounded by a river, and riparian rights are those that such an owner has to the use of the water, including access to it at all stages.”).

²⁰As the United States Supreme Court stated in an important early opinion on river boundaries: “Where a survey and a patent show a river to be one of the boundaries of the tract, it is a legal deduction that there is no vacant land left for appropriation between the river and the river boundary of such tract.” *County of St. Clair v. Lovingson*, 90 U.S. 46, 63 (1874).

²¹See also *County of St. Clair v. Lovingson*, 90 U.S. at 66-69; *Coastal Industrial Water Auth. v. York*, 532 S.W.2d 949, 952 (Tex. 1976); *Manry v. Robison*, 56 S.W.2d 438, 444 (Tex. 1932); *Denny v. Cotton*, 22 S.W.122, 124 (Tex. Civ. App. 1893, writ ref’d).

* * *

Artificial accretion is unlike natural accretion only in so far as the start of the process is influenced by a change in water flow affected by an artificial rather than a natural cause. The process itself, however, is in fact natural, and, like natural accretion, occurs gradually and imperceptibly.

Id. at 18-19.

By way of further explanation, the *Brainard* Court quoted from an 1874 United States Supreme Court opinion rejecting an Illinois county's suit to eject a riparian landowner from new land accreted as a result of piers, wharfs, and other improvements along the Mississippi River:

It is insisted . . . that the accretion was caused wholly by obstructions placed in the river above, and that hence the rules upon the subject of alluvion do not apply. If the fact be so, the consequence does not follow The proximate cause was the deposits made by the water. The law looks no further. Whether the flow of the water was natural or affected by artificial means is immaterial.

Brainard, 12 S.W.3d at 19 (quoting *County of St. Clair v. Lovington*, 99 U.S. at 66).²²

Nevertheless, a riparian owner does not obtain title to an accretion when he or she caused that accretion. *Brainard*, 12 S.W.3d at 19; *Coastal Industrial Water Auth. v. York*, 532 S.W.2d at 952-53 (stating “[a] riparian or littoral owner may not acquire title to submerged land through self-help by filling and raising the land level.”). For example, in *Lorino v. Crawford Packing Co.*, 175 S.W.2d 410, 414 (Tex. 1943), the Texas Supreme Court held that the owner of an offshore oyster house who gradually built up a dry land connection to the shore by continually dumping oyster shells into the water did not gain title to the dry land by accretion. The anti-self-help rule exemplified by *Lorino* is sometimes called the “landfill” rule. *Brainard*, 12 S.W.3d at 15.

In 1993, the Corpus Christi Court of Appeals considered the type or degree of participation by a landowner that will trigger the “landfill” rule. In *Natland Corp. v. Baker's Port*, 865 S.W.2d 52 (Tex. App.—Corpus Christi 1993, writ denied), the Corps of Engineers dredged the intracoastal waterway and piled dredge spoils on dry land inland from the shore pursuant to an easement with Natland's predecessor. In subsequent years, rain, wind, and gravity washed some of the dredge spoils into the water, creating thirty-six acres of “new land.” The State argued that under the “landfill” rule of *Lorino*, it continued to own the 36-acre “new” extension that previously had been submerged land. The *Natland* court disagreed, holding that the landowner's predecessor's granting an easement to a third party—the Corps of Engineers—to deposit spoils on dry land was not sufficient participation to trigger the “landfill” rule. The court of appeals wrote: “the action of the Corps of Engineers of depositing spoil material does not prevent the upland owner from gaining title to land created by the gradual run-off of the material.” *Id.* at 58. See *Brainard*, 12 S.W.3d at 22 (citing *Natland* with approval and stating “according to *Natland*, *Lorino* did not preclude the vendor from acquiring title to the land, even though the dredging activities had influenced the process of accretion.”)²³

²²See also *Bonelli Cattle Co. v. Arizona*, 414 U.S. 313 (1973), overruled on choice of law grounds in *Oregon v. Corvallis Sand & Gravel Co.*, 429 U.S. 363 (1977); *Coastal Industrial Water Auth. v. York*, 532 S.W.2d at 952-53.

VII. Changes that Do Not Shift the Boundary—Avulsion and Subsidence.

There are two established exceptions to the rule that the boundary line moves along with changes in a river. Those exceptions are for avulsion and land subsidence.

A. Avulsion. Texas also follows the rule that avulsive changes in a river's course do not change ownership boundaries. "Avulsion" is a sudden and perceptible change in a river's course, or a "sudden removal or deposit of riparian land." *Brainard*, 12 S.W.3d at 17. An avulsion can occur when a river suddenly abandons its old channel and creates a new one. *Id.*; see *Oklahoma v. Texas*, 260 U.S. at 640 ("Such avulsive action does not carry the boundary with it, but leaves it where it was before."). The distinction between non-avulsive and avulsive changes is that the former are "gradual and imperceptible," while the latter are "sudden and perceptible." The courts have explained that a change in the river remains "gradual and imperceptible" if it can be said that "though the witnesses may see, from time to time, that progress has been made, they could not perceive it while the progress was going on." *Brainard*, 12 S.W.3d at 18.²⁴

B. Subsidence. Land subsidence is the sinking of the land's surface, caused principally by man's withdrawal of large volumes of underground water for municipal and industrial use. As the Texas Supreme Court twice has recognized, land subsidence presents major problems in Harris and Galveston Counties. See *Friendswood Development Co. v. Smith-Southwest Industries, Inc.*, 576 S.W.2d 21, 23-24 (Tex. 1978); *Coastal Industrial Water Auth. v. York*, 532 S.W.2d 949, 951-52 (Tex. 1976). By the time of the *York* case, land in the vicinity of the San Jacinto Monument on the Houston Ship Channel had subsided approximately nine feet over seventy years. *Id.* at 951. The Harris-Galveston Coastal Subsidence District's website includes a contour map of subsidence in feet in the Houston-Galveston area, which shows a loss in surface elevation from one to ten feet between 1906 through 2000 throughout much of the two county area.²⁵

York is the leading Texas subsidence decision. The Texas Supreme Court framed the questions in *York* as "the ownership of riparian land which has subsided or sunk slowly beneath the water level of the Houston Ship Channel," 532 S.W.2d at 951, and "whether the submergence of land to which [a riparian owner] has title necessarily divests him of that title." *Id.* at 953. The Court held that the gradual subsidence of the land's surface shown in *York*, as distinguished from accretion and erosion, "is not an ordinary hazard of riparian ownership; it is not the result of the force of the waters which takes from some owners and gives to others." *Id.* at 954.

The Court observed in *York* that "[t]here have been cases approving private ownership of soil beneath navigable water," and that "submergence does not necessarily destroy the title of the owner." *Id.* at 953-54.²⁶ The Court concluded that the private owner retained ownership of approximately three acres of land submerged under the waters of the Ship Channel as a result of subsidence. As a result, the Coastal Industrial Water Authority was required to pay for the submerged acreage when it condemned the adjacent dry land. In *Brainard*, the Texas Supreme Court summarized its holding in *York* as follows: "a riparian owner does not lose title to submerged land resulting from the effects of subsidence caused by the activities of cities and industries over which the riparian owner has no control." 12 S.W.3d at 20.

²⁴In *Brainard*, the Court also rejected the state's argument that the closing of Sanford Dam produced an "inherently avulsive" change in the Canadian River that could not affect riparian boundaries. 12 S.W.3d at 24-25.

²⁵http://www.landsubsidence.org/Map1_files/slide0015.html.

²⁶See, e.g., *Port Acres Sportsman's Club v. Mann*, 541 S.W.2d 847, 848 (Tex. Civ. App.—Beaumont 1976, writ ref'd n.r.e.); See also Op. Tex. Att'y Gen. No. GA-0181 (2004) (acknowledging that submerged lands under tidally-influenced waters can remain in private ownership).

There will no doubt be future litigation regarding the effect of subsidence on the ownership of riparian lands along the Houston Ship Channel, Buffalo Bayou, the San Jacinto River, and other rivers in areas affected by subsidence. The Port of Houston Authority reads *York* very narrowly and contends *York* does not apply to riparian land submerged in tidally-influenced waters as a result of subsidence. The Port Authority apparently believes that it, as the state's grantee, has gained ownership of all previously-dry, but now submerged, land lying below mean high tide along the Ship Channel.²⁷

It is difficult for this author to accept the Port Authority's position in light of the holding in *York* that the well-recognized regional subsidence in Harris and Galveston Counties is *not* one of the risks of riparian ownership and Article I, § 17 of the Texas Constitution, which states: "No person's property shall be taken, damaged, or destroyed for or applied to public use without adequate compensation being made . . ."

²⁷See the testimony of the executive director of the Port Authority given April 8, 2004, at trial of *Kirby Inland Marine, L.P. v. TH Investments, Inc.*, No 2003-12846, 334th District Court, Harris County, Texas. In effect, the Port Authority seeks to elevate the "background default rule" Mr. Ratliff has described in an earlier paper at this conference into a preemptive rule that controls even when the sovereign expressly conveyed the now-subsided land into private ownership. See Shannon H. Ratliff, *Shoreline Boundaries, Part I: Legal Principles*, Texas Coastal Law Conference, May 19-20, 2005 at text accompanying notes 3-5. (For disclosure, the author is one of the lawyers representing the private landowner in the appeal of a judgment favorable to the Port Authority in the *Kirby Inland Marine* case.)

