

Fall 1973

## Florida's Sovereignty Submerged Lands: What Are They, Who Owns Them, and Where is the Boundary?

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### Recommended Citation

Glenn J. MacGrady, *Florida's Sovereignty Submerged Lands: What Are They, Who Owns Them, and Where is the Boundary?*, 1 Fla. St. U. L. Rev. 596 (1973) .

<https://ir.law.fsu.edu/lr/vol1/iss4/2>

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## NOTES

### FLORIDA'S SOVEREIGNTY SUBMERGED LANDS: WHAT ARE THEY, WHO OWNS THEM AND WHERE IS THE BOUNDARY?

Landowners, both public and private, naturally desire to locate the boundaries of their property. Usually this question is resolved by a surveyor, who draws a physical line on the ground. Sometimes, however, disputes arise and the line must be drawn by the courts. Nowhere is line drawing more difficult and confusing—both physically and legally—than at the shore, where private uplands<sup>1</sup> abut the restless waters.

This note will focus upon a class of lands, known as sovereignty lands, submerged beneath the waters. Part I will discuss the history, definition, ownership and regulation of sovereignty lands. Part II will discuss the practical and legal problems that arise with regard to the boundary line between riparian lands<sup>2</sup> and sovereignty lands. Particular emphasis throughout will be given to the seacoast, as opposed to inland lakes and rivers, and to applicable Florida law.

#### I. SOVEREIGNTY LANDS: WHAT ARE THEY AND WHO OWNS THEM?

##### A. *The Public Trust Doctrine*

To ensure that the public rights, *inter alia*, of navigation, commerce, fishing and bathing would be protected, the common law of England provided that the Crown, in its sovereign capacity, held title to the beds of navigable and tidal waters in trust for the people of the realm.<sup>3</sup> Thus lands beneath *navigable* waters,<sup>4</sup> whether tidal<sup>5</sup> or fresh, have come to be known as “sovereignty lands,”<sup>6</sup> and the common law

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1. Uplands are lands “bordering on bodies of waters.” *Martin v. Busch*, 112 So. 274, 285 (Fla. 1927).

2. Technically, “riparian” land is land which borders a river, whereas “littoral” land is land bordering a lake or the ocean. *See City of Eustis v. Firster*, 113 So. 2d 260 (Fla. 2d Dist. Ct. App. 1959). However, the term “riparian land” is commonly used to refer to property that borders any type of waterbody, and will be so used in this note.

3. *See Shively v. Bowlby*, 152 U.S. 1 (1894); *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892); *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893). *See generally* F. MALONEY, S. PLAGER & F. BALDWIN, *WATER LAW AND ADMINISTRATION—THE FLORIDA EXPERIENCE* §§ 120-22 (1968).

4. The navigability concept is discussed in part I (B) of the text *infra*.

5. The frequently encountered terms “tidal lands” or “tidelands” refer to that class of sovereignty lands submerged beneath tidally affected waters. Tidelands include the “foreshore,” which is the strip of land between the ordinary high-tide and ordinary low-tide lines. *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *State ex rel. Ellis v. Gerbing*, 47 So. 353 (Fla. 1908); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893).

6. *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Broward v. Mabry*, 50 So. 826 (Fla. 1909).

doctrine that protects the public's interests in these lands has come to be known as the "public trust doctrine."<sup>7</sup>

The public trust doctrine was carried over to the New World, and was applied to the lands beneath navigable waters within the English Colonies in America prior to 1776. Thus, these lands were held in trust for the colonists by the sovereign Crown.<sup>8</sup> After the American Revolution the people of each newly independent state themselves became sovereign, with the result that title to all lands beneath the navigable waters of each newly independent state devolved upon the government of that state.<sup>9</sup> Consequently, the government of each new state held these sovereignty lands in trust for its citizens to protect the public rights of navigation, commerce, fishing and bathing.

Any lands beneath navigable waters which were not within the jurisdictional boundaries of one of the original thirteen states, and any such lands which were later acquired from foreign governments, were held in trust by the federal government "for the ultimate benefit of future States."<sup>10</sup> In order that these future states be admitted to the union on an equal footing with the original states it was held that

[n]ew states . . . have the same rights, prerogatives, and duties with respect to the navigable waters and the lands thereunder within their borders as have the original thirteen states of the American Union. Among these prerogatives are the right and duty of the states to own and hold the lands under navigable waters for the benefit of the

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7. On the subject of the public trust doctrine, see *Shively v. Bowlby*, 152 U.S. 1 (1894); *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892); *Bryant v. Lovett*, 201 So. 2d 720 (Fla. 1967); *Gies v. Fischer*, 146 So. 2d 361 (Fla. 1962); *Hayes v. Bowman*, 91 So. 2d 795 (Fla. 1957); *Pierce v. Warren*, 47 So. 2d 857 (Fla. 1950), *cert. denied*, 341 U.S. 914 (1951); *Perky Properties v. Felton*, 151 So. 892 (Fla. 1934); *Deering v. Martin*, 116 So. 54 (Fla. 1928); *Martin v. Busch*, 112 So. 274 (Fla. 1927); *State ex rel. Buford v. City of Tampa*, 102 So. 336 (Fla. 1924); *Apalachicola Land & Dev. Co. v. McRae*, 98 So. 505 (Fla. 1923); *State ex rel. Ellis v. Gerbing*, 47 So. 353 (Fla. 1908); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893); *Morgan v. Canaveral Port Authority*, 202 So. 2d 884 (Fla. 4th Dist. Ct. App. 1967); F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 122; Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970); Note, *Conveyances of Sovereign Lands Under the Public Trust Doctrine: When Are They in the Public Interest?*, 24 U. FLA. L. REV. 285 (1972); Note, *The Public Trust in Tidal Areas: A Sometime Submerged Traditional Doctrine*, 79 YALE L.J. 762 (1970).

8. *Broward v. Mabry*, 50 So. 826 (Fla. 1909).

9. *Martin v. Waddell*, 41 U.S. (16 Pet.) 367, 410 (1842), stating: "For when the Revolution took place, the people of each state became themselves sovereign; and in that character hold the absolute right to all their navigable waters and the soils under them for their own common use . . ." *Accord*, *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893).

10. *United States v. Holt State Bank*, 270 U.S. 49, 55 (1926); *accord*, *Shively v. Bowlby*, 152 U.S. 1 (1894); *Pollard v. Hagan*, 44 U.S. (3 How.) 212 (1845); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893).

people, as such prerogatives are essential to the sovereignty, to the complete exercise of the police powers, and to the welfare of the people of the new states as of the original states of the Union.<sup>11</sup>

In 1819 the United States government signed a treaty with Spain whereby Spain would cede to the United States "all of the territories . . . known by the name of East and West Florida [and] the adjacent islands."<sup>12</sup> When the United States took possession of the Floridas in July 1821, pursuant to the Treaty of Cession, the public trust doctrine became operative and required the United States government to hold "the lands under the navigable waters, including the shores or spaces between the ordinary high and low-water marks and tidelands, for the use and benefit of the state that was to be subsequently formed . . ."<sup>13</sup> When Florida achieved statehood on March 3, 1845, it was "admitted into the Union on an equal footing with the original states, in all respects whatsoever,"<sup>14</sup> and thus took title to all sovereignty lands within its borders.<sup>15</sup> The only lands under navigable waters which did not pass to Florida upon its achieving statehood were those that had been granted by the Spanish government to private individuals before the Treaty of Cession<sup>16</sup> and those that the United States government had validly conveyed out while Florida was still a territory.<sup>17</sup>

When Florida took title to all the sovereignty lands within its borders as a result of achieving statehood, a concomitant public trust devolved upon the state to protect and preserve these sovereignty lands.<sup>18</sup> The primary purpose and effect of this public trust is to restrict aliena-

11. *Broward v. Mabry*, 50 So. 826, 829-30 (Fla. 1909); *accord*, *Shively v. Bowlby*, 152 U.S. 1 (1894); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893).

12. Treaty of Amity, Settlement, and Limits With Spain, Feb. 22, 1819, art. II, 8 Stat. 252, 254 (1846), T.S. No. 327 (effective Feb. 29, 1821) (known as the Treaty of Cession).

13. *Martin v. Busch*, 112 So. 274, 283 (Fla. 1927). *See also* *Shively v. Bowlby*, 152 U.S. 1 (1894); *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *State ex rel. Ellis v. Gerbing*, 47 So. 353 (Fla. 1908).

14. Act of Congress, March 3, 1845, 5 Stat. 742 (1848).

15. *See* *Shively v. Bowlby*, 152 U.S. 1 (1894); *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *State ex rel. Ellis v. Gerbing*, 47 So. 353 (Fla. 1908); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893).

16. In the Treaty of Cession there was "an expressed provision that all the grants of land made by Spain before January 24, 1818, in said territories, shall be ratified and confirmed to the persons in possession of the lands." *State ex rel. Ellis v. Gerbing*, 47 So. 353, 355 (Fla. 1908).

17. *See* *Shively v. Bowlby*, 152 U.S. 1 (1894). *See also* *United States v. Holt State Bank*, 270 U.S. 49, 55 (1926), stating that "disposals by the United States during the territorial period are not lightly to be inferred, and should not be regarded as intended unless the intention was definitely declared or otherwise made very plain."

18. *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893); *see* *Shively v. Bowlby*, 152 U.S. 1 (1894).

tion and use of sovereignty lands. The earliest Florida decision<sup>19</sup> on the public trust doctrine is *State v. Black River Phosphate Co.*,<sup>20</sup> in which the Florida Supreme Court explained the purpose of the doctrine:

[T]he navigable waters of the state and the soil beneath them . . . were the property . . . of the people of the state in their united or sovereign capacity, and were held, not for the purposes of sale or conversion into other values, or reduction into several or individual ownership, but for the use and enjoyment of the same by all the people of the state for at least the purposes of navigation and fishing and other implied purposes . . . .<sup>21</sup>

The Court also explained the restrictions inherent in the public trust doctrine:

“[A]bdication [of control over sovereignty lands] is not consistent with the exercise of that trust which requires the government of the state to preserve such waters for the use of the public. The trust devolving upon the state for the use of the public . . . cannot be relinquished by a transfer of the property. The control of the state for the purpose of the trust can never be lost, except as to such parcels as are used in *promoting the interests of the public therein*, or can be disposed of *without any substantial impairment of the public interest in the lands and waters remaining.*”<sup>22</sup>

Although the public trust doctrine, with its inherent restrictions on alienation and use, was originally judge-made law in Florida, it is now incorporated into article X, section 11, of the present Florida constitution, which declares that sovereignty lands are “held by the state . . . in trust for all the people” and that “[s]ale of such lands may be authorized by law, but only when in the public interest.”<sup>23</sup>

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19. The important federal decisions are *Shively v. Bowlby*, 152 U.S. 1 (1894), and *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892). For other Florida cases dealing with the public trust doctrine see note 7 *supra*.

20. 13 So. 640 (Fla. 1893).

21. *Id.* at 648.

22. *Id.* at 645 (emphasis added), quoting from *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387, 453 (1892).

23. It is noteworthy to point out that the present 1970 amended version of the constitution permits sale of sovereignty lands only when “in” the public interest, whereas the 1968 version permitted sale only when “not contrary” to the public interest. Thus the present provision is more restrictive with regard to sales of sovereignty lands than was its predecessor; the previous version would have permitted sales that were “neutral” in regard to the public interest.

### B. Navigability

The designation of any given parcel of submerged land as sovereignty land will depend upon whether the overlying waters can be denominated as navigable. A finding of navigability is important in this respect because it will determine whether title to the submerged land passed to the state upon achieving statehood. The problem that has ultimately faced the courts has been to formulate a definition of navigability.

Navigability questions usually arise in regard to fresh water lakes and streams,<sup>24</sup> since salt waters, affected by the tides, are generally presumed to be navigable.<sup>25</sup> The federal test of navigability was first

24. In general, regarding bodies of fresh water, Florida law holds that lands beneath navigable fresh water streams and lakes are sovereignty lands, and that title thereto is held by the state in trust for the public, *Watson v. Holland*, 20 So.2d 388 (Fla. 1944); *Hicks v. State ex rel. Landis*, 156 So. 603 (Fla. 1934); *Deering v. Martin*, 116 So. 54 (Fla. 1928); *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Broward v. Mabry*, 50 So. 826 (Fla. 1909); that lands beneath nonnavigable lakes and streams are subject to private ownership, *Pounds v. Darling*, 77 So. 666 (Fla. 1918); *Clement v. Watson*, 58 So. 25 (Fla. 1912); and that the boundary between sovereign (navigable) fresh water bodies and private upland is the ordinary high-water mark of the waterbody. *Martin v. Busch*, *supra*.

For Florida cases dealing with the navigability question in regard to specific lakes, see *Baker v. State ex. rel. Jones*, 87 So. 2d 497 (Fla. 1956) (Cromartie Arm of Lake Tomonia, dry for periods of up to two years, nonnavigable); *Osceola County v. Triple E Dev. Co.*, 90 So. 2d 600 (Fla. 1956) (Buck Lake, type 3 lake, 378 acres, nonnavigable); *Cat Lake*, type 3 lake, under 500 acres at time of litigation, 2080 acres in 1969, nonnavigable); *McDowell v. Trustees of the Internal Improvement Fund*, 90 So. 2d 715 (Fla. 1956) (Lake Ariand, type 3 lake, 1026 acres, navigable); *Crutchfield v. F.A. Sebring Realty Co.*, 69 So. 2d 328 (Fla. 1954) (Basket Lake, type 4 lake, 56 acres, nonnavigable); *Hicks v. State ex rel. Landis*, *supra* (Lake Santa Fe, type 3 lake, 4721 acres, navigable); *Martin v. Busch*, *supra* (Lake Okeechobee, navigable); *Broward v. Mabry*, *supra* (Lake Jackson, part of of lake dry during summer months and used for pasturage and crop growing, mean depth of lake not more than two feet, navigable); *North Dade Water Co. v. Adken Land Co.*, 130 So. 2d 894 (Fla. 3d Dist. Ct. App. 1961) (Myrtle Lake, type 3 lake, 12 acres, non-navigable); *Florio v. State*, 119 So. 2d 305 (Fla. 2d Dist. Ct. App. 1960) (Egypt Lake, type 4 lake, 75 acres, used for water skiing school, nonnavigable); *Adams v. Crews*, 105 So. 2d 584 (Fla. 2d Dist. Ct. App. 1958) (Lake Maitland, type 3 lake, 451 acres, navigable); *Duval v. Thomas*, 107 So. 2d 148 (Fla. 2d Dist. Ct. App. 1958), *cert. dismissed with opinion*, 114 So. 2d 791 (Fla. 1959) (Lake Calm, type 4 lake, 127 acres, nonnavigable). In all of the above cases the "type" and the surface acreage of the lake, when not mentioned in the case itself, were determined by reference to DIVISION OF WATER RESOURCES, FLORIDA BOARD OF CONSERVATION, PART III GAZETTEER, FLORIDA LAKES (1969). Therefore, in some cases the surface acreage listed may not be representative of the acreage at the time of litigation.

For a discussion of the problems relating to fresh water lakes and streams, see F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 127.

25. See *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892); *Bucki v. Cone*, 6 So. 160 (Fla. 1889); 33 H. HALSBURY, LAWS OF ENGLAND 555-56 (2d ed. D. Hailsham 1939); F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 22.2(a). See generally 1 WATERS AND WATER RIGHTS §§ 36-40 (R. Clark ed. 1967). But see *Clement v. Watson*, 58 So. 25, 26 (Fla. 1912); note 92 *infra*.

formulated in *The Propeller Genesee Chief v. Fitzhugh*,<sup>26</sup> in which the Supreme Court held lakes and rivers usable "for commercial purposes and foreign trade"<sup>27</sup> to be navigable, and therefore within the admiralty and maritime jurisdiction of the United States government. In *The Daniel Ball*<sup>28</sup> it was stated that all rivers in the United States "must be regarded as public navigable rivers in law which are navigable in fact."<sup>29</sup> The Court elaborated upon the meaning of this "navigability in fact" test in *United States v. Holt State Bank*, stating:

[S]treams or lakes . . . are navigable in fact when they are used, or are susceptible of being used, in *their natural and ordinary condition*, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water; and further that navigability does not depend on the particular mode in which such use is or may be had—whether by steamboats, sailing vessels or flatboats—nor on an absence of occasional difficulties in navigation, but on the fact, if it be a fact, that the stream *in its natural and ordinary condition* affords a channel for useful commerce.<sup>30</sup>

The federal test of navigability was broadened—and the "natural and ordinary condition" requirement relaxed—by the decision in *United States v. Appalachian Electric Power Co.*,<sup>31</sup> where the Court held a waterbody to be navigable in law if it could be made navigable in fact by "reasonable improvements."<sup>32</sup> Thus, under the present federal test of navigability, a waterbody can be navigable in law even though it may not be currently navigable in fact, provided that it can be made navigable in fact by future reasonable improvements.<sup>33</sup>

The test of navigability formulated by the Florida courts is basically that of navigability in fact. The development of the Florida test began with *Bucki v. Cone*,<sup>34</sup> which stated that all rivers are navigable "as

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26. 53 U.S. (12 How.) 443 (1851).

27. *Id.* at 457.

28. 77 U.S. (10 Wall.) 557 (1870).

29. *Id.* at 563.

30. 270 U.S. 49, 56 (1926) (emphasis added).

31. 311 U.S. 377 (1940).

32. *Id.* at 407-08.

33. In the *Appalachian Electric* case the Court stated that it is not "necessary that the improvements should be actually completed or even authorized." *Id.* at 408. In regard to the federal test of navigability, see *Economy Light & Power Co. v. United States*, 256 U.S. 113 (1921); *Davis v. United States*, 185 F.2d 938 (9th Cir. 1950), *cert. denied*, 340 U.S. 932 (1951); *Starr, Navigable Waters of the United States—State and National Control*, 35 HARV. L. REV. 154 (1921).

34. 6 So. 160 (Fla. 1889).

far up as they may be conveniently used . . . for purposes of commerce. . . . [W]hat constitutes a navigable river . . . is a question of fact, to be determined by the natural conditions in each case."<sup>35</sup> The broadened federal test, as declared in the *Appalachian Electric* case, has been rejected by the Florida Supreme Court, which has stated that the factual determination of navigability must be based on the condition of the waterbody in its natural state, without artificial improvement.<sup>36</sup> In *Broward v. Mabry*<sup>37</sup> the Florida Supreme Court determined that navigability would be tested in terms of current potential for commercial use, rather than by commercial history, stating: "Whether the lake has been used for commercial purposes or not is immaterial, if it may be made useful for any considerable navigation or commercial intercourse between the people of a large area."<sup>38</sup>

Some states have considered recreational boating to be a significant factor when testing the navigability of a lake or stream.<sup>39</sup> In a state such as Florida, where tourism and recreational water activities are prevalent, such an approach to navigability would seem logical. The Florida courts, however, have not yet specifically decided whether recreational boating can be considered a "commercial use" when testing navigability, but, by dictum, have indicated a willingness to do so.<sup>40</sup>

The importance of the federal test of navigability vis-a-vis the Florida test arises primarily as a choice of law problem when different parties are declaring adverse rights in the same parcel of submerged land and/or in the overlying waters. In general, when the asserted rights are not of the sort derived from the federal Constitution, navigability will be determined by the state test.<sup>41</sup> On the other hand, as

35. *Id.* at 161.

36. *Clement v. Watson*, 58 So. 25 (Fla. 1912).

37. 50 So. 826 (Fla. 1909).

38. *Id.* at 831.

39. *See, e.g., Kerley v. Wolfe*, 84 N.W.2d 748 (Mich. 1957); *City of Grand Rapids v. Powers*, 50 N.W. 661 (Mich. 1891); *State ex rel. Lyon v. Columbia Water Power Co.*, 63 S.E. 884 (S.C. 1909); *Muench v. Public Serv. Comm'n*, 53 N.W.2d 514 (Wis. 1952).

Other states determine navigability by the "log test"; *i.e.*, a stream is navigable if it is capable of floating a log to market. *See Collins v. Gerhardt*, 211 N.W. 115, 116-17 (Mich. 1926); *Village of Bloomer v. Town of Bloomer*, 107 N.W. 974, 979 (Wis. 1906). *See also Bucki v. Cone*, 6 So. 160, 162 (Fla. 1889) (Suwannee River).

40. *See Baker v. State ex rel. Jones*, 87 So. 2d 497 (Fla. 1956); *Broward v. Mabry*, 50 So. 826 (Fla. 1909); *Lopez v. Smith*, 145 So. 2d 509 (Fla. 2d Dist. Ct. App. 1962).

41. Examples of nonconstitutional rights, which may depend upon the navigability or nonnavigability of the waterbody in question, might include the right of one upland owner to make nonconsumptive uses of the water vis-a-vis other upland owners and the right of the general public to make nonconsumptive uses of the water vis-a-vis an upland owner. The primary nonconsumptive uses are boating, fishing, swimming and such related matters as wharfing and access. *See generally* F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at §§ 22.1-2.



held by the Supreme Court in *United States v. Holt State Bank*,<sup>42</sup> "[n]avigability, when asserted as the basis of a right arising under the Constitution of the United States, is necessarily a question of federal law to be determined according to the general rule recognized and applied in the federal courts."<sup>43</sup> The most important consequence of the *Holt State Bank* choice of law rule is that navigability will be tested by the federal (reasonable improvement) test when determining whether title to the bed of a waterbody passed from the federal government to the state upon the grant of statehood.<sup>44</sup>

### C. Ownership and Regulation of Sovereignty Lands

The governmental agency that currently holds title to and has jurisdiction over sovereignty lands in Florida is the Board of Trustees of the Internal Improvement Trust Fund,<sup>45</sup> which consists of the Governor and the Cabinet.<sup>46</sup> The Board of Trustees was created by the legislature in 1854 and given the following powers and duties:<sup>47</sup> to obtain and hold title to all internal improvement lands<sup>48</sup> and all swamp and overflow lands;<sup>49</sup> to use these lands for the promotion of a system of

42. 270 U.S. 49 (1926).

43. *Id.* at 55-56.

44. *Id.*; accord, *United States v. Oregon*, 295 U.S. 1, 14 (1935).

45. Hereinafter referred to as the "Trustees" or the "Board of Trustees."

46. FLA. STAT. § 253.02 (1971).

47. Fla. Laws 1854, ch. 610. A predecessor of the 1854 Board of Trustees had been created in 1850 for the purpose of "securing and classifying" swamp and overflow lands. Fla. Laws 1850, ch. 332. In 1852, the 1850 agency was revised and given the power to "recommend plans for the reclamation of swamp lands." Fla. Laws 1852, ch. 496. It was not until the 1854 Act that the "true" predecessor of the present Board of Trustees was fully created.

48. On Sept. 4, 1841, Congress granted 500,000 acres of land to a named class of states, and to each new state thereafter admitted into the union, for the purpose of the internal improvement of these states. 43 U.S.C. § 857 (1970). The grant of land became applicable to Florida upon its admission into the union on March 3, 1845. These 500,000 acres were the "internal improvement lands" referred to in ch. 610 of the 1854 Laws of Florida.

49. By the Swamp Land Grant Act of 1850 Congress patented to the State of Florida all "swamp and overflow" lands within its boundaries. 43 U.S.C. § 864 (1970). This grant eventually amounted to a total of 20,500,000 acres. Statement to the Environmental Land Management Study (ELMS) Committee by Joel Kuperberg, Executive Director, Board of Trustees of the Internal Improvement Trust Fund, Sept. 14, 1972.

"Swamp" lands are defined as those which "require drainage to dispose of needless water or moisture on or in the lands, in order to make them fit for successful and useful cultivation." *State ex rel. Ellis v. Gerbing*, 47 So. 353, 357 (Fla. 1908). "Overflow" lands are defined as

those that are covered by nonnavigable waters, or are subject to such periodical or frequent overflows of water, salt or fresh (not including lands between high and low water marks of navigable streams or bodies of water, nor lands covered and uncovered by the ordinary daily ebb and flow of normal tides of navigable waters),

internal improvements; and to place the proceeds from the sale of these lands into a special internal improvement fund. From the time of its creation in 1854 until 1913, the Board of Trustees did not hold title to or have the power to alienate sovereignty lands.<sup>50</sup> During this period of time the Board of Trustees primarily concerned itself with managing and selling the internal improvement lands and the swamp and overflow lands to which it did hold title.<sup>51</sup> Title to various classes of sovereignty lands, and a concomitant power to regulate and alienate such lands, was vested in the Trustees by an incremental legislative process that began in 1913 and culminated in 1969.<sup>52</sup>

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as to require drainage or levees or embankments to keep out the water and thereby render the lands suitable for successful cultivation.

*Id.* As is apparent from these definitions of swamp and overflow lands, the Swamp Land Grant Act of 1850 did not include any sovereignty lands; nor could it, since all sovereignty lands vested in the State of Florida upon its admission to the union in 1845. See cases cited in note 15 *supra*.

50. See *Pierce v. Warren*, 47 So. 2d 857 (Fla. 1950).

51. Upon its creation in 1854 the Board of Trustees embarked upon a whirlwind campaign of selling internal improvement lands and swamp and overflow lands that had been placed in the internal improvement fund. The campaign has been described as follows:

Railroad development was the first phase, beginning with the very statute that created the Internal Improvement Fund . . . [S]ome 1,100 miles of railway were built, for which the Trustees granted land premiums totalling slightly more than 9,000,000 acres. In addition, the federal government granted as further encouragement 2,220,000 acres from the Public Domain. These various grants combined amounted to a full third of all the land area in the state [which is about 34,000,000 acres], an average of about 10,000 acres for each mile of railroad constructed.

By the 1880's [there was] a shift of interest to the second broad phase of Trustee operations: drainage and land reclamation. . . [I]n 1881 . . . 4,000,000 acres were sold into private ownership for reclamation purposes . . . In addition . . . the Trustees conveyed some 2,780,000 acres of land to private companies as a premium for various waterway improvements.

Statement to the ELMS Committee by Joel Kuperberg, Executive Director, Board of Trustees of the Internal Improvement Trust Fund, Sept. 14, 1972.

The 4,000,000 acre sale in 1881 was made to Hamilton Disston, a Philadelphia industrialist, for the price of 25¢ per acre. F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 101.1 (b). Of the 21,000,000 acres originally granted to Florida by the congressional acts of 1841 and 1850, see notes 47 & 48 *supra*, 20,589,000 acres have been conveyed out by the Trustees, leaving 411,000 acres presently remaining in the internal improvement fund. Statement by Joel Kuperberg, *supra*.

52. Fla. Laws 1913, ch. 6451, § 1 (repealed 1957) (title to islands, sand bars and shallow banks in the tidal waters of Dade and Palm Beach Counties); Fla. Laws 1915, ch. 6960, § 1 (repealed 1957) (title to islands, sandbars and shallow banks in the tidal waters of Monroe County); Fla. Laws 1917, ch. 7304, § 1 (title to islands, sand bars and shallow banks in all Florida counties); Fla. Laws 1951, ch. 26776, §§ 1, 2 (title to all sovereignty tidal water bottoms except as to lands in Dade and Palm Beach Counties); Fla. Laws 1957, ch. 57-362, § 1 (popularly known as the Bulkhead Act) (title to all sovereignty tidal lands and submerged bottom lands, including shallow banks, sand bars and islands located in navigable waters, except submerged lands in navigable fresh water lakes, rivers and streams); Fla. Laws 1969, ch. 69-308, § 1 (title to submerged bottom

The increasing authority over sovereignty lands, which was given to the Trustees after 1913, was complicated by the fact that, from 1856 to 1957, riparian owners had limited statutory authority to gain title to certain types of sovereignty lands. The original source of this statutory authority was the Riparian Act of 1856,<sup>53</sup> which declared:

The State of Florida . . . [divests itself] of all right, title and interest to all lands covered by water, lying in front of any tract of land owned by a citizen of the United States . . . lying upon any navigable stream, or Bay of the Sea, or Harbor, as far as to the edge of the channel, and hereby vest[s] the full title to the same in and unto the riparian proprietors, giving them the full right and privilege to build wharves into streams or waters of the Bay or Harbor as far as may be necessary to effect the purposes described, and to fill up from the shore, bank or beach, as far as may be desired, not obstructing the channel, but leaving full space for the requirements of Commerce.  
 . . .<sup>54</sup>

The language of the Riparian Act appears to vest in the riparian owner unqualified title to the submerged lands adjacent to his uplands. Subsequent judicial interpretation of the Act, however, held that the riparian owner's interest in the submerged lands was more in the nature of a defeasible easement,<sup>55</sup> and that the riparian owner had no greater rights in the submerged lands than did the general public until he actually wharfed or filled his uplands out to the channel.<sup>56</sup>

In 1921 the legislature passed the Butler Act,<sup>57</sup> which had the same purpose, and contained essentially the same wording, as the Riparian Act of 1856.<sup>58</sup> Like the Riparian Act, also, the Butler Act was judicially construed to vest in the riparian owner no absolute title to adjacent submerged lands "until such submerged lands are filled in or permanently improved."<sup>59</sup> Consequently, the riparian owner could be de-

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lands in navigable fresh water lakes, rivers and streams). See also Fla. Laws 1970, ch. 70-97, § 1 amending FLA. STAT. § 253.12(1971) (provided that sovereignty lands in navigable meandered fresh water lakes shall be administered in accordance with § 253.151 of the Florida statutes).

53. Fla. Laws 1856, ch. 791.

54. Fla. Laws 1856, ch. 791, § 1. The *quid pro quo* for the state's divesting itself of title to these submerged lands lay in the fact that it was "for the benefit of [Florida's] Commerce that wharves be built and Warehouses erected for facilitating the landing and storage of goods . . . ." Fla. Laws 1856, ch. 791 (preamble).

55. *Brickell v. Trammell*, 82 So. 221 (Fla. 1919).

56. *State v. Black River Phosphate Co.*, 13 So. 640 (Fla. 1893).

57. Fla. Laws 1921, ch. 8537.

58. For a general treatment of the Riparian Act of 1856 and the Butler Act of 1921, see F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 123.

59. *Stein v. Brown Properties, Inc.*, 104 So. 2d 495, 499 (Fla. 1958). See also *Duval*

prived of all title and interest in adjacent sovereignty lands if the state alienated the lands before he had perfected his qualified title by means of the requisite wharfing or filling.<sup>60</sup>

The Butler Act was repealed in 1957 by the passage of the Bulkhead Act.<sup>61</sup> The Bulkhead Act revoked the authority of riparian owners to gain title to adjacent sovereignty lands by wharfing or filling, and enlarged the class of sovereignty lands in which the Board of Trustees was vested with title.<sup>62</sup> The effect of the Bulkhead Act, as amended in chapter 253 of the Florida statutes, is that no one can acquire title to state sovereignty lands except by purchase from the Board of Trustees.<sup>63</sup>

As a result of the legislative process that incrementally vested title in the Trustees,<sup>64</sup> and as a result of the repeal of the Butler Act, the Board of Trustees is now the sole proprietor of all sovereignty lands that have not been validly alienated.<sup>65</sup> At present the Trustees hold title to all tidal and submerged bottom lands in the coastal and intra-coastal waters of the state, all islands, sandbars and shallow banks in navigable waters of the state, and all lands submerged beneath navigable fresh-water lakes, rivers and streams.<sup>66</sup> In addition, the Trustees are statutorily invested with the following regulatory powers over sovereignty lands: (1) the power to convey sovereignty lands to which they hold title so long as the conveyance is determined to be "in the public interest";<sup>67</sup> (2) the power to approve or reject offshore bulkhead lines

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Eng'r & Contracting Co. v. Sales, 77 So. 2d 431 (Fla. 1954); Holland v. Fort Pierce Financing & Constr. Co., 27 So. 2d 76 (Fla. 1946).

60. Bridgehead Land Co. v. Hale, 199 So. 361 (Fla. 1940).

61. Fla. Laws 1957, ch. 57-362. The more important provisions of the Bulkhead Act are now incorporated into §§ 253.12, 253.122-24 of the Florida statutes. The constitutionality of the Bulkhead Act was upheld in Gies v. Fisher, 146 So. 2d 361, 363 (Fla. 1962).

62. See note 52 *supra*.

63. See FLA. STAT. § 253.12 (2) (a) (Supp. 1972).

64. See note 52 *supra*.

65. The Board of Trustees does not hold title to "submerged lands heretofore conveyed by deed or statute." FLA. STAT. § 253.12 (1) (Supp. 1972). Conveyances made by the Board of Trustees subsequent to 1913 are specifically ratified, confirmed and validated, notwithstanding certain publication defects which might have attended the sale. FLA. STAT. § 253.121 (1971).

66. FLA. STAT. § 253.12 (1) (Supp. 1972).

67. FLA. STAT. § 253.12 (2) (a) (Supp. 1972). The requirement that the sale be "in the public interest" is mandated by article X, section 11, of the Florida constitution. See note 23 and accompanying text *supra*. In order to aid the Board of Trustees in its determination of whether a sale would be in the public interest, the Trustees must, at the applicant's expense, be provided with a biological survey, an ecological study and, if deemed necessary by the Department of Natural Resources, a hydrographic survey. FLA. STAT. § 253.12 (7) (a) (Supp. 1972). When a person makes application to purchase sovereignty lands, he must also have before the Board of Trustees an application for the

which have been preliminarily fixed by local authorities;<sup>68</sup> (3) the power to regulate dredging in navigable waters by virtue of their authority to issue dredge permits;<sup>69</sup> and (4) the power to regulate construction and filling in navigable waters by virtue of their authority to "approve, reject or issue" construction or fill permits, where such permits have been initially granted by local authorities.<sup>70</sup>

The power of the state to regulate dredging and filling in navigable waters, including the case where the underlying sovereignty land is privately owned, has been upheld by the Florida Supreme Court against constitutional attack. In *Zabel v. Pinellas County Water & Navigation Control Authority*<sup>71</sup> it was held that the right of a riparian owner to fill and bulkhead his adjacent sovereignty land is "a legitimate public concern and as such is subject to reasonable regulation under the police power."<sup>72</sup> Similarly, the power of the state to fix off-

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establishment of a bulkhead line and an application for a dredge and fill permit. FLA. STAT. § 253.12 (2) (b) (Supp. 1972).

68. FLA. STAT. § 253.122 (1) (1971). A bulkhead line is defined as the line beyond which the outward filling of land "shall be deemed an interference with the servitude in favor of commerce, navigation, and conservation of natural resources, with which the navigable waters of this state are inalienably impressed." FLA. STAT. § 253.122 (1) (1971). Thus a bulkhead line, when established, represents the seaward limit of permissible construction and land-filling.

Bulkhead lines are initially located and fixed by local authorities. FLA. STAT. § 253.122 (1971). Before establishing a bulkhead line, the local authorities must, if required by the Department of Natural Resources, and at the applicant's expense, be provided with a biological survey, an ecological study and, if deemed necessary by the Department of Natural Resources, a hydrographic survey. FLA. STAT. § 253.122 (3) (1971).

69. FLA. STAT. § 253.123 (1971). All dredging of sovereignty lands requires a permit from the Board of Trustees. FLA. STAT. § 253.123 (3) (a) (1971). Dredge permits are only allowed to be issued in certain limited instances. FLA. STAT. § 253.123 (2) (1971).

70. FLA. STAT. § 253.124 (2) (Supp. 1972). Construction and fill permits are initially approved by local authorities. FLA. STAT. § 253.124 (1) (Supp. 1972). Before issuing or approving such a permit, the local authorities must, at the applicant's expense, be provided with a biological survey, an ecological study and, if deemed necessary by the Department of Natural Resources, a hydrographic survey. FLA. STAT. § 253.124 (3) (Supp. 1972). However, such surveys and studies need not be required if the proposed construction or filling is wholly within a previously established bulkhead line. FLA. STAT. § 253.124 (3) (Supp. 1972). The reason for this exception is that such surveys and studies would already have been made as a prerequisite to the establishment of the bulkhead line. See note 68 *supra*.

71. 171 So. 2d 376 (Fla. 1965).

72. *Id.* at 379 (footnote omitted). Although the *Zabel* court upheld the state's power to regulate the bulkheading and filling of privately owned sovereignty land, it also held that "[s]uch regulation, absent proof of an overriding public necessity, constitutes the taking of private property without just compensation." *Id.* at 379-80 (footnote omitted). In order to insure that the denial of a permit would be a proper exercise of police power, as opposed to an unconstitutional taking of private property, the court held that local authorities bear the burden of proving "that the granting of the permit would materially and adversely affect the public interest." *Id.* at 381. The local authorities and the trial court had erroneously placed a burden on the permit applicant to show that the granting

shore bulkhead lines, which represent the seaward limit of permissible construction and fill operations,<sup>73</sup> has been upheld. In *Gies v. Fischer*<sup>74</sup> the Florida Supreme Court sustained the constitutionality of the Bulkhead Act of 1957 and held that a bulkhead line could be constitutionally fixed across privately owned submerged lands.<sup>75</sup> The *Gies* court based its holding upon two alternative theories; namely, "as police regulation or [as] an exercise of retained power under the trust doctrine governing sovereign lands."<sup>76</sup>

Under present statutory law—as upheld in cases such as *Zabel* and *Gies*—a riparian proprietor who desires to wharf or fill adjacent sovereignty land must now follow a complicated three-part procedure. Basically, he must first have an offshore bulkhead line fixed by local authorities<sup>77</sup> and approved by the Board of Trustees;<sup>78</sup> next, he must purchase the sovereignty lands within the bulkhead line from the Board of Trustees;<sup>79</sup> and, finally, he must obtain a dredge and fill permit which has been approved by local authorities<sup>80</sup> and by the Board of Trustees.<sup>81</sup> Even if a riparian proprietor owns sovereignty lands by virtue of a previous valid conveyance from the Trustees, he may hold only bare legal title. Under *Zabel* such a proprietor cannot wharf, dredge or fill his submerged land without a permit<sup>82</sup> and, under *Gies*, he can in no event wharf or fill beyond the established bulkhead line.<sup>83</sup>

In addition to the Board of Trustees, the Department of Natural Resources (DNR) is also currently invested with certain regulatory power over sovereignty lands. Under the Beach and Shore Preservation

of a permit would result in no adverse effect upon the public interest. *Id.* at 379.

73. See note 68 *supra*.

74. 146 So. 2d 361 (Fla. 1962).

75. The effect of the *Gies* decision was that the owner of the submerged lands, over which the bulkhead line had been fixed, could not fill his submerged property seaward of the bulkhead line. Thus, he was effectively precluded from using that portion of his submerged parcel of land which lay seaward of the bulkhead line.

76. 146 So. 2d at 363. The usual attack on the state's regulation of land use is that the regulatory measures amount to a taking of private property without due process of law. See, e.g., *Zabel v. Pinellas County Water & Navigation Control Authority*, 171 So. 2d 376 (Fla. 1965). The state's usual response is that the regulation is a reasonable exercise of the police power. *Id.* at 379. The *Gies* case reveals that when the land to be regulated is sovereignty land, the state has an additional legal foundation for the exercise of regulatory powers; namely, its duty under the public trust doctrine to preserve navigable waters and the underlying sovereignty land for the ultimate benefit of the public at large.

77. FLA. STAT. § 253.122 (1971); see note 68 *supra*.

78. FLA. STAT. § 253.122(1) (1971).

79. FLA. STAT. § 253.12(2) (Supp. 1972); see note 67 *supra*.

80. FLA. STAT. § 253.124 (Supp. 1972); see notes 69 & 70 *supra*.

81. FLA. STAT. § 253.124(2) (Supp. 1972).

82. See note 72 *supra*.

83. See note 75 *supra*.

Act<sup>84</sup> a permit is required from the Division of Marine Resources of the DNR prior to the commencement of any "coastal construction"<sup>85</sup> upon, or removal of beach material from, sovereignty lands which lie below the mean high-water line of Florida's tidal waters.<sup>86</sup> Any such construction or physical activity undertaken without a permit is deemed to be a public nuisance and the DNR can request the Department of Legal Affairs to institute legal proceedings to enjoin or abate it.<sup>87</sup> Moreover, regardless of the date of construction or whether a permit has been issued by the DNR, any coastal construction on state sovereignty lands can be ordered altered or removed if the DNR determines that the structure serves no public purpose, is dangerous to human life, health and welfare, or is undesirable or unnecessary.<sup>88</sup>

The requirement of a coastal construction permit from the DNR seems to be duplicative of the dredge and fill permits required from the Board of Trustees under sections 253.123 and 253.124 of the Florida statutes.<sup>89</sup> One distinction between the scope of the respective permitting powers of the two agencies, however, can clearly be made: the DNR has permitting authority only below the mean high-water line of "tidal waters,"<sup>90</sup> whereas the Board of Trustees has permitting authority in all "navigable waters."<sup>91</sup> Thus the DNR, in contrast to the Board of Trustees, has no permitting authority over construction or dredging in navigable bodies of fresh water.<sup>92</sup>

84. FLA. STAT. ch. 161 (1971). The Beach and Shore Preservation Act was originally enacted in 1965. Fla. Laws 1965, ch. 65-408, § 1. It was subsequently amended in 1969, 1970 and 1971. Fla. Laws 1969, ch. 69-106, §§ 25, 35; Fla. Laws 1970, ch. 70-276, §§ 1-8; Fla. Laws 1970, ch. 70-439, § 1; Fla. Laws 1971, ch. 71-136, §§ 82, 83; Fla. Laws 1971, ch. 71-182, § 1; Fla. Laws 1971, ch. 71-280, § 1; Fla. Laws 1971, ch. 71-377, § 43.

85. "'Coastal construction' includes any work or activity which is likely to have a material physical effect on existing coastal conditions or natural shore processes." FLA. STAT. § 161.021(4) (1971).

86. FLA. STAT. § 161.041 (1971). It is stipulated that the granting of a coastal construction permit shall not "affect title of the state to any lands below the mean high water mark, and any additions or accretions to the upland caused by erection of such works or improvements shall remain the property of the state if not previously conveyed. . . ." FLA. STAT. § 161.051 (1971).

87. FLA. STAT. § 161.081 (1971).

88. FLA. STAT. § 161.061 (1) (1971). If the upland owner does not remove or alter the structure when so requested, the DNR can do so at its own expense. The cost of the alteration or removal by the DNR becomes a lien on the property of the upland owner. FLA. STAT. § 161.061 (2) (1971).

89. See notes 69 & 70 *supra*.

90. FLA. STAT. § 161.041 (1971).

91. FLA. STAT. § 253.123 (1971); FLA. STAT. § 253.124 (Supp. 1972).

92. In the case of tidal waters, another possible distinction can be made between the respective permitting powers of the DNR and the Board of Trustees. The DNR has permitting authority over sovereignty lands which lie below the mean high-water line of "any" tidal water of the state, FLA. STAT. § 161.041 (1971), whereas the Board of Trustees

## II. THE BOUNDARY LINE: WHERE IS IT?

Once it is understood that the state holds title to lands submerged beneath navigable waters, the question remains as to what is the precise boundary line between these state-owned sovereignty lands and privately owned uplands. In regard to bodies of nontidal fresh water, the rule in Florida is that the boundary line is the ordinary high-water mark.<sup>93</sup> The Florida Supreme Court has stated that the high-water mark is to be determined by

*examining the bed and banks, and ascertaining where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark upon the soil of the bed a character distinct from that of the banks, in respect to vegetation, as well as respects the nature of the soil itself.*<sup>94</sup>

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has permitting authority over lands on or in "navigable waters." FLA. STAT. § 253.123 (1971); FLA. STAT. § 253.124 (Supp. 1972). This distinction may be significant because there is judicial authority in Florida for the proposition that all tidal waters are not necessarily navigable. *See* *Clement v. Watson*, 58 So. 25, 26 (Fla. 1912), stating:

While the navigable waters in the state and the lands under such waters, including the shore, or space between high and low water marks, are held by the state for the purpose of navigation and other public uses, subject to lawful governmental regulation, yet this rule is applicable only to such waters as by reason of their size, depth, and other conditions are in fact capable of navigation for useful public purposes. Waters are not under our law regarded as navigable merely because they are affected by the tides.

Thus, in the case of tidal waters, it is arguable that the DNR has broader regulatory power than does the Board of Trustees. Whereas the permitting power of the Trustees is limited to lands in or on "navigable" waters, the permitting power of the DNR might be construed to reach sovereignty lands below the mean high-water line of ("any") non-navigable tidal waters as well as to those lands below the mean high-water line of ("any") navigable tidal waters.

On the other hand, such a distinction between the scope of the permitting powers of the DNR and the Board of Trustees may be more illusory than real. First of all, the regulatory power of the DNR reaches only such construction and dredging which occurs "upon sovereignty lands of Florida, below the mean high water line of any tidal water of the state . . ." FLA. STAT. § 161.041 (1971) (emphasis added). Secondly, "sovereignty lands" have been traditionally defined as including only those lands submerged beneath navigable waters. *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Broward v. Mabry*, 50 So. 826 (Fla. 1909). By interpreting § 161.041 in the light of the traditional definition of "sovereignty lands," the statutory language would turn in upon itself—with the result that the DNR's permitting authority extends only to construction or dredging on lands below the mean high-water line of *navigable* tidal waters. Thus, it is arguable that the permitting powers of the DNR and the Board of Trustees in tidal waters are identical in scope.

93. *Tilden v. Smith*, 113 So. 708 (Fla. 1927); *Martin v. Busch*, 112 So. 274 (Fla. 1927); *Brickell v. Trammell*, 82 So. 221 (Fla. 1919). *See generally* F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 32.2(a). Florida statutory law buttresses case law with respect to the "ordinary high water mark" boundary line. In order for riparian rights to attach, "[t]he land to which the owner holds title must extend to the ordinary high water mark of the navigable water . . ." FLA. STAT. § 197.315(3)(a) (1971).

94. *Tilden v. Smith*, 113 So. 708, 712 (Fla. 1927). The Florida court quoted the lan-



With respect to such bodies of fresh water as inland lakes, the high-water mark will be quite stable and, as a practical matter, there will be only one water line and no "shore."<sup>95</sup>

In coastal areas—with which the remainder of this note is primarily concerned—boundary line demarcation is a more difficult problem, both physically and legally. It is at the coast that private uplands abut sovereignty lands submerged beneath tidally affected waters. As a result of the tides the water line advances and recedes across a strip of land known as the "foreshore";<sup>96</sup> consequently, no one position of this ambulatory water line can be considered "ordinary." The rule adopted in Florida is that the coastal boundary is demarcated by what has variously been described as the "mean high-tide line,"<sup>97</sup> the "ordinary high-water mark"<sup>98</sup> or the "mean high-water line."<sup>99</sup> This boundary standard is also used by most of the other coastal states<sup>100</sup> and by the federal government.<sup>101</sup>

The concept of a "mean high-tide line" is seemingly a simple one. When it becomes necessary to translate this concept into a physical line on the shore, however, two broad problems of scientific and legal import are raised: (a) establishing the precise meaning of "mean high

guage from *Carpenter v. Board of Comm'rs*, 58 N.W. 295, 297 (Minn. 1894). In turn, this same language can be traced virtually verbatim to the concurring opinion of Justice Curtis in *Howard v. Ingersoll*, 54 U.S. (13 How.) 381, 427 (1851), a case which concerned the boundary along the western bank of Chattahoochee River. See *Corker, Where Does the Beach Begin, and to What Extent is this a Federal Question*, 42 WASH. L. REV. 33, 70 (1966).

95. F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 32.2 (a). See *Humble Oil & Ref. Co. v. Sun Oil Co.*, 190 F.2d 191, 194 (5th Cir. 1951), *cert. denied*, 342 U.S. 920 (1952), stating: "The term shore, precisely defined, is not appropriate to land on the side of water that is not affected by the ebb and flow of the tide."

96. See note 5 *supra*. In coastal beach areas the foreshore is sometimes referred to as the "wet sand."

97. See *Trustees of the Internal Improvement Fund v. Wetstone*, 222 So. 2d 10, 14 (Fla. 1969).

98. See *Miller v. Bay-To-Gulf*, 193 So. 425, 427 (Fla. 1940).

99. See FLA. CONST. art. X, § 11.

100. Sixteen states use the mean high-water mark as the boundary between private uplands and coastal sovereignty lands: Alabama, Alaska, California, Connecticut, Florida, Louisiana (in some situations), Maryland, Mississippi, New Jersey, New York, North Carolina, Oregon, Rhode Island, South Carolina, Texas and Washington. F. Maloney & R. Ausness, *The Proposed Florida Coastal Mapping Act of 1973 and Its Relationship to Coastal Boundary Determination and Coastal Zone Management in Florida, 1973*, at 73 (unpublished report submitted to the Florida Legislature). Ten states use the low-water mark, or a variation thereof, as the coastal boundary: Delaware, Georgia, Louisiana (in some situations), Maine, Massachusetts, Minnesota, New Hampshire, Pennsylvania, Virginia and Wisconsin. *Id.* Hawaii, Illinois and Michigan have boundary standards peculiar to their jurisdictions. *Id.*

101. See *Borax Consol., Ltd. v. Los Angeles*, 296 U.S. 10, 22 (1935).

tide," and (b) ascertaining where on the shore the line of mean high tide is located.

### A. Tides and the Mean High-Tide Line

In order to understand the historical difficulty in defining the mean high-tide line, and the continuing practical difficulty in locating that line, it is necessary to be somewhat familiar with the scientific aspects of tidal phenomena.<sup>102</sup>

1. *The Tides.*—The tide is defined as the "periodic rising and falling of the water that results from the gravitational attraction of the moon and sun acting on the rotating earth."<sup>103</sup> The quantum of gravitational force exerted upon the earth by the sun and moon is, in turn, directly related to the relative astronomical positions of the earth, sun and moon vis-a-vis each other.<sup>104</sup> As is commonly known, these three bodies are constantly changing their relative astronomical positions in accordance with certain mathematically predictable cycles: e.g., the earth rotates on its axis once every 24 hours (a solar day),<sup>105</sup> the moon revolves around the earth once every 29.53 days (a synodic month), and the earth revolves around the sun once every 365¼ days (a year).<sup>106</sup>

These recurrent and overlapping cyclical movements of the earth, moon and sun produce three major categories of periodic fluctuations in tidal elevation—"monthly" fluctuations, "daily" fluctuations and "long period" fluctuations. Since the moon is the major tide-producing body,<sup>107</sup> its effective tide-producing power being more than twice that of the sun,<sup>108</sup> these three major categories of tidal fluctuations are primarily associated with the cyclical movements of the moon vis-a-vis the earth.<sup>109</sup>

With regard to the relative movement of the earth and moon, there

102. Good expositions of tidal phenomena are found in Gay, *The High Water Mark: Boundary Between Public and Private Lands*, 18 U. FLA. L. REV. 553 (1966); Roberts, *The Luttes Case—Locating the Boundary of the Seashore*, 12 BAYLOR L. REV. 141 (1960).

103. U.S. DEP'T OF COMMERCE, COAST AND GEODETIC SURVEY, SPEC. PUB. NO. 228, TIDE AND CURRENT GLOSSARY 36 (rev. ed. 1949).

104. I A. SHALOWITZ, SHORE AND SEA BOUNDARIES 84 (U.S. Dep't of Commerce, Coast and Geodetic Survey, Pub. No. 10-1, 1962).

105. R. RUSSELL & D. MACMILLAN, WAVES AND TIDES 186 (2d rev. ed. 1954).

106. See *id.* at 192, 196; H. MARMER, TIDAL DATUM PLANES 6 (U.S. Dep't of Commerce, Coast and Geodetic Survey Spec. Pub. No. 135) (rev. ed. 1951).

107. H. MARMER, *supra* note 106, at 2.

108. Although the sun has a mass 27,000,000 times as great as that of the moon, it is 389 times as far away from the earth. *Id.* This ratio of distance to mass accounts for the fact that the sun's tide-producing power is only 0.46 times that of the moon. R. RUSSELL & D. MACMILLAN, *supra* note 105, at 192. See also G. ABELL, EXPLORATION OF THE UNIVERSE 224-25 (1964).

109. See generally H. MARMER, *supra* note 106, at 5.

are actually three "monthly" cycles that occur. A major "monthly" tidal fluctuation is associated with each of these three cycles. First, the phase of the moon (new moon, first quarter moon, full moon, third quarter moon) varies in a cycle which occupies 29.53 days (a synodic month).<sup>110</sup> Secondly, the declination of the moon (north-south position of the moon in the sky)<sup>111</sup> varies in a cycle which occupies  $27\frac{1}{3}$  days (a tropic month).<sup>112</sup> Thirdly, the distance of the moon from the earth varies in a cycle which occupies  $27\frac{1}{2}$  days (an anomalistic month).<sup>113</sup>

The strongest "monthly" influence on tidal elevation is caused by the variations in the moon's phase.<sup>114</sup> When the sun and moon are in conjunction or opposition, they are positioned in a straight line relative to the earth;<sup>115</sup> thus their gravitational forces cumulate.<sup>116</sup> This (straight line) phenomenon occurs twice each synodic month, at full moon and new moon, causing relatively high tides known as "spring tides."<sup>117</sup> When the sun and moon are at quadrature, they are positioned at right angles to each other relative to the earth; thus, their respective gravitational forces are partially cancelled out.<sup>118</sup> This (right angle) phenomenon also occurs twice every synodic month, at first quarter moon and third quarter moon, causing relatively low tides known as "neap tides."<sup>119</sup>

The second major influence on "monthly" tidal fluctuations is that caused by the changes in the moon's declination. When the moon is "over" the equator, its tide-affecting force is at a minimum.<sup>120</sup> The re-

110. See *id.* at 6; R. RUSSELL & D. MACMILLAN, *supra* note 105, at 192; I A. SHALOWITZ, *supra* note 104, at 86.

111. The plane of the moon's orbit is inclined to the plane of the earth's equator. Thus as the moon orbits the earth it will travel approximately as far north as the Tropic of Cancer and approximately as far south as the Tropic of Capricorn, crossing the equator twice during each revolution. This change in the moon's "overhead" position, with respect to the earth's north-south latitudes, is known as the moon's declination. See generally R. RUSSELL & D. MACMILLAN, *supra* note 105, at 200-04. The maximum declination of the moon is  $28\frac{1}{2}^{\circ}$  north and  $28\frac{1}{2}^{\circ}$  south. *Id.* at 200.

112. H. MARMER, *supra* note 106, at 6.

113. *Id.*

114. *Id.* at 5; I A. SHALOWITZ, *supra* note 104, at 86.

115. The linear alignment of the sun (S), earth (E) and moon (M) at conjunction is: S-M-E. The alignment at opposition is: S-E-M. See generally R. RUSSELL & D. MACMILLAN, *supra* note 105, at 196-97; G. ABELL, *supra* note 108, at 174. The new moon occurs at time of conjunction; the full moon at time of opposition. *Id.* Both conjunction and opposition of the moon are also referred to as "syzygy," "a term never used by astronomers, but . . . often encountered in crossword puzzles." *Id.*

116. See I A. SHALOWITZ, *supra* note 104, at 86-87; G. ABELL, *supra* note 108, at 225.

117. I A. SHALOWITZ, *supra* note 104, at 86-87; H. MARMER, *supra* note 106, at 5.

118. I A. SHALOWITZ, *supra* note 104, at 86-87; G. ABELL, *supra* note 108, at 225.

119. I A. SHALOWITZ, *supra* note 104, at 86-87; G. ABELL, *supra* note 108, at 225.

120. See H. MARMER, *supra* note 106, at 5; R. RUSSELL & D. MACMILLAN, *supra* note 105, at 203.

sulting tide is known as an "equatorial tide."<sup>121</sup> As the moon's declination increases (moon moves "closer" to the tropics of Cancer or Capricorn),<sup>122</sup> its tide-affecting force increases.<sup>123</sup> At maximum north or south declination the resultant tides are known as "tropic tides."<sup>124</sup> There are two equatorial and two tropic tides each tropic month (27½ days).<sup>125</sup>

The third major influence on "monthly" tidal fluctuations is that produced by the variations in the moon's orbital distance from earth during the anomalistic month. Gravitational force exerted by the moon on the earth is a direct function of orbital distance; thus, tide-producing power will be greater when the moon is close and lesser when the moon is distant.<sup>126</sup> At maximum distance (apogee) the resultant tides are known as "apogean tides"; at minimum distance (perigee), as "perigean tides."<sup>127</sup>

As a practical matter, the "monthly" lunar cycles of phase, declination and distance are on-going phenomena which occur simultaneously, constantly overlapping and interacting in innumerable combinations of tide-producing forces. Thus these three lunar cycles are significant not only because of their independent "monthly" effects, but also because of their joint daily effects on the day-to-day tidal fluctuations familiar to the layman.

Daily tides are of three general types: semidaily (or semidiurnal) tides, daily (or diurnal) tides and mixed tides.<sup>128</sup> The difference among these three types of tides has been described as follows:

As the name suggests, the semidaily type of tide is one in which the full tidal cycle of high and low water is completed in half a day; in other words, in a day there are two high and two low waters in this type of tide. There is, however, the further implication that the two tidal cycles in each day resemble each other; that is, morning and afternoon tides do not differ much. In this connection, it is to be noted that a day in the tidal sense is a tidal day of 24 hours and 50 minutes and not the ordinary day of 24 hours.

The daily type of tide includes those tides in which but one high and one low water occur in a day. In this type of tide the rise and

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121. H. MARMER, *supra* note 106, at 5.

122. *See* note 111 *supra*.

123. *See* H. MARMER, *supra* note 106, at 5; R. RUSSELL & D. MACMILLAN, *supra* note 105, at 203.

124. H. MARMER, *supra* note 106, at 5.

125. *See* R. RUSSELL & D. MACMILLAN, *supra* note 105, at 203.

126. *See id.* at 187.

127. H. MARMER, *supra* note 106, at 5.

128. *Id.* at 9.

also the fall of the tide each occupies a period of approximately 12 hours against a period of 6 hours in the semidaily tide.

The mixed type of tide is one in which two high and two low waters occur in a day, but with marked differences between the two high waters or between the two low waters of the day . . . [T]he mixed type of tide arises as a mixture of semidaily and daily tides, and hence its name.<sup>129</sup>

The semidiurnal tide prevails along the Atlantic Coast, the mixed tide along the Pacific Coast, and the diurnal tide in the Gulf of Mexico.<sup>130</sup> There are, however, two areas along the Gulf Coast where the tide is mixed, and both are in Florida.<sup>131</sup> Thus Florida's coastal waters are characterized by all three types of tides.

In addition to the three "monthly" tidal cycles and the three types of "daily" tidal fluctuations, there are some long-period astronomical cycles that influence the tides. In a period of 18.03 years (known as the Saros cycle) the recurrence of all possible eclipses will complete one full cycle;<sup>132</sup> in a period of 18.6 years (known as the Nodal cycle or regression of the moon's nodes) the moon will pass through all possible changes in declination;<sup>133</sup> and in a period of 19 years (known as the Metonic cycle) the moon will pass through all possible recurrences of phase.<sup>134</sup> Thus, as a practical matter, all possible combinations of tide-influencing astronomical cycles and, consequently, all possible fluctuations in tidal elevation, will be complete after the 19 year period of the Metonic cycle.<sup>135</sup>

2. *The Meaning of "Mean High Tide."*—As previously discussed, the boundary between private uplands and public sovereignty lands

129. *Id.*

130. 1 A. SHALOWITZ, *supra* note 104, at 163-64. The difference in elevation of the two daily high tides or the two daily low tides especially characteristic of the mixed type of tide is known as "diurnal inequality." This diurnal inequality is caused by the moon's declination. H. MARMER, *supra* note 106, at 11.

131. The first area extends from Key West to Punta Rasa in San Carlos Bay; the second includes the area from Indian Rocks near St. Petersburg to St. George Sound. 1 A. SHALOWITZ, *supra* note 104, at 164 n. 132.

132. R. RUSSELL & D. MACMILLAN, *supra* note 105, at 186, 208; see G. ABELL, *supra* note 108, at 212-13.

133. R. RUSSELL & D. MACMILLAN, *supra* note 105, at 186, 200, 208.

134. *Id.* at 186, 208.

135. There is one tide-influencing astronomical cycle (known as the Perigee/Perihelion Syzygy cycle) that is of a longer period than the Metonic cycle. Once every 1,600 years the following circumstances coincide to produce the greatest possible tide-raising forces: the earth is at its closest point to the sun (perihelion), the moon is at its closest point to the earth (perigee), the moon and sun are in conjunction or opposition (syzygy), and the moon and sun are both at zero declination. Such an astronomical coincidence is calculated to have occurred in 3500 B.C., 1900 B.C., 250 B.C. and 1433 A.D. The next such coincidence is predicted for 3300 A.D. See *id.* at 207-08.

is variously stated to be the "mean high-tide line" or the "ordinary high-water mark." In light of the foregoing exposition of tidal phenomena it should be apparent that the meaning of these phrases is far from clear. There are numerous sorts of "high" tides, all of which recur and overlap in "daily," "monthly" or long-period cycles. Of which of these "high" tides is the mean (or average) to be taken? Which of these high waters can be said to be "ordinary"? These questions eventually confronted jurists and the courts.

At common law the shore belonged to the king in his sovereign capacity.<sup>136</sup> The shore was defined by the English courts as those lands covered by the "flux and reflux of the sea at ordinary tides."<sup>137</sup> Lord Chief Justice Hale (1609-1676) concluded that the tides which defined the shore were the "[o]rdinary tides, or nepe tides, which happen between the full and change of the moon."<sup>138</sup> It is not clear whether Lord Hale used the term "nepe tides" in accordance with its presently accepted definition,<sup>139</sup> *i.e.*, the relatively low tides which occur twice monthly when the sun and moon are at quadrature.<sup>140</sup> It is clear, however, that he ruled out the spring tides, which occur at new and full moons, as the tides which define the "shore."<sup>141</sup> The reason Lord Hale gave for excluding the relatively high spring tides was that they flow over lands which for most of the month are "dry and maniorable."<sup>142</sup>

In *Attorney-General v. Chambers*<sup>143</sup> the English high court thoroughly reviewed the problem of which "ordinary tide" should define the boundary of the shore.<sup>144</sup> The court recognized that Lord Hale had rejected the bi-monthly spring tides as the shore-defining tide principally because they occur so seldom. By interpreting Hale's use of "neap tide" as referring only to the low tides which occur twice a month, the *Chambers* court found that neap tides and spring tides "happen

136. F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at 75.

137. *Blundell v. Catterall*, 5 B. & Ald. 268, 292 (1821); *see* 1 A. SHALOWITZ, *supra* note 104, at 91.

138. *Borax Consol., Ltd. v. Los Angeles*, 296 U.S. 10, 24 (1935) (quoting, without exact citation, from Hale's treatise *DE JURE MARIS*); *see* F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at 75; 1 A. SHALOWITZ, *supra* note 104, at 91.

139. "[A] careful reading of Lord Hale's designation of 'neap tides' shows that it is susceptible of two interpretations: (1) all the tides that occur between the full and change of the moon, and (2) only those tides that occur twice a month at the time of the first and third quarters when the moon is in quadrature." 1 A. SHALOWITZ, *supra* note 104, at 91.

140. *See* notes 118 & 119 and accompanying text *supra*.

141. *Borax Consol., Ltd. v. Los Angeles*, 296 U.S. 10, 24 (1935).

142. *Id.*

143. 4 De G.M. & G. 206 (1854).

144. *See Borax Consol., Ltd. v. Los Angeles*, 296 U.S. 10, 24 (1935). . . .

as often as each other,"<sup>145</sup> and thus rejected neap tides on the same principle of infrequency that Hale had used in rejecting spring tides.<sup>146</sup> The court then ruled that the shore boundary is best defined by "the line of the medium high tide between the springs and the neaps."<sup>147</sup> It was felt that this line was appropriate because "[a]ll land below that line is more often than not covered at high water, and so may justly be said, in the language of Lord Hale, to be covered by the ordinary flux of the sea."<sup>148</sup>

*Chambers* had an important influence on the 1935 decision of the United States Supreme Court in *Borax Consolidated, Ltd. v. Los Angeles*,<sup>149</sup> the landmark federal decision on the law of tidal boundaries. *Borax* not only interpreted the term "ordinary high-water mark," but also established the first precise procedure for locating the boundary line on the shore. The issue before the *Borax* Court was whether the "ordinary high-water mark" should be determined by the line of neap tides or by a contour representing the line of mean high tide.<sup>150</sup> The Court quoted extensively from *Chambers*, which had rejected Hale's neap tide rule, and stated: "In determining the limit of the federal grant, we perceive no justification for taking neap high tides, or the mean of those tides, as the boundary between upland and tideland, and for thus excluding from the shore the land which is actually covered by the tides most of the time."<sup>151</sup> The precise boundary rule of *Chambers* ("medium high tide between the springs and the neaps") was not, however, adopted in *Borax*. The Court held the boundary to be "the mean high tide line which . . . is neither the spring tide nor the neap tide, but a mean of *all the high tides*."<sup>152</sup> By relying on a publication of the United States Coast and Geodetic Survey,<sup>153</sup> the Court also held that "in order to ascertain the mean high tide line . . . 'an average of 18.6 years should be determined as near as possible.'"<sup>154</sup> Thus, under *Borax*, the boundary between private uplands

145. 4 De G.M. & G. at 214.

146. See 1 A. SHALOWITZ, *supra* note 104, at 92.

147. 4 De G.M. & G. at 217.

148. *Id.*

149. 296 U.S. 10 (1935).

150. See Petitioner's Brief for Certiorari at 5, *Borax Consol., Ltd. v. Los Angeles*, 296 U.S. 10 (1935); Corker, *supra* note 94, at 57. Petitioner (*Borax*) was asserting that the boundary should be controlled by the neap tide rule as adopted in California by the case of *Teschmacher v. Thompson*, 18 Cal. 11 (1861). See 296 U.S. at 26.

151. 296. U.S. at 26.

152. *Id.* (emphasis added).

153. The Court quoted from the 1927 edition of H. MARMER, *supra* note 106.

154. 296 U.S. at 27.

and public sovereignty lands is determined by averaging all the high tides that occur within an 18.6 year period.<sup>155</sup>

There is one important limitation on the scope of the *Borax* rule. The issue raised and decided in *Borax* was the boundary "limit of the federal grant."<sup>156</sup> Thus the *Borax* rule would apply, for example, to define the seaward boundary of any land which originated in a federal patent. This does not mean, however, that all property rights which may involve the upland-tideland boundary are necessarily controlled by *Borax*. As the *Borax* Court itself pointed out: "Rights and interests in the tideland, which is subject to the sovereignty of the State, are matters of local law."<sup>157</sup> Professor Corker has identified the following five situations as ones to which the *Borax* rule does not apply:<sup>158</sup>

*a. Mexican or other foreign grants.* . . . [State law applies in this situation.]<sup>159</sup> This is anomalous, but well settled, and removes much of the California coastline from any compulsion of *Borax*.<sup>160</sup>

*b. Non-federal uplands.* *Borax* does not apply at all in the original states, or in Texas,<sup>161</sup> which had no federal public lands, except as the United States may acquire lands in such states. It does not apply to school lands, swamp and overflowed lands, or other uplands belonging to the state.

*c. Exceptions in favor of the federally claimed right.* States may yield their claims to upland owners, in whole or in part. . . .

155. In adopting 18.6 years as the measurement period the *Borax* Court quoted from the 1927 edition of H. MARMER, *supra* note 106, as follows: "'from theoretical considerations of an astronomical character' there should be 'a periodic variation in the rise of water above sea level having a period of 18.6 years . . .'" 296 U.S. at 27. This 18.6 year cycle referred to in the 1927 edition of H. MARMER is obviously the Nodal Cycle (regression of the moon's nodes). See note 133 and accompanying text *supra*. Thus the 1927 edition of H. MARMER apparently ignored the longer 19 year Metonic Cycle (recurrence of lunar phases). See note 134 and accompanying text *supra*. It is interesting to note that the corresponding references in the current edition of H. MARMER provide as follows: "mean high water at any place may be defined simply as the average height of the high waters at that place over a period of 19 years." H. MARMER, *supra* note 106, at 86 (emphasis added). "A primary determination of mean high water is based directly on the average of the high waters over a 19-year period." *Id.* at 87 (emphasis added). Thus the National Ocean Survey (formerly the U.S. Coast and Geodetic Survey) now recognizes the Metonic Cycle as the appropriate period for tidal measurement.

156. See 296 U.S. at 22, 26.

157. *Id.* at 22.

158. Corker, *supra* note 94, at 97 (some original footnotes omitted; original footnotes retained have been renumbered; footnote 162 added by author).

159. See *Borax Consol., Ltd. v. Los Angeles*, 296 U.S. 10, 15-16 (1935).

160. See *Carpenter v. City of Santa Monica*, 147 P.2d 964, 970-72 (Cal. Ct. App. 1944) (hearing denied by California Supreme Court).

161. See *Luttes v. State*, 324 S.W.2d 167, 192 (Tex. 1958).



*d. Res judicata, estoppel,<sup>162</sup> prescription, statute of limitations.* These doctrines, mostly based on state law, may alter boundaries originally established by a *Borax* rule.<sup>163</sup> There has been no suggestion that state laws in these categories are inapplicable to land which has a history of federal ownership.<sup>164</sup>

*e. Non-tidal waters.* There is no analogue of *Borax* applicable to inland navigable waters.

Since *Borax* does not control in some situations, the states are free to set their own upland-tideland boundary in these situations. Some states, for example, have adopted a low-water mark standard.<sup>165</sup> As mentioned, Florida has always had a "mean high-water" or "ordinary high-water" standard.<sup>166</sup> Until 1968, however, Florida's high-water standard was determined according to the neap tide rule of Lord Hale.<sup>167</sup> In 1968 a "mean high-water line" test was written into article X, section 11, of the Florida constitution. This test arguably incorporates the *Borax* rule.<sup>168</sup>

### *B. Location of the Mean High-Water Line on the Shore*

Once a definition of mean high water has been settled upon, it is

162. For Florida cases addressing the issue of estoppel against the state in situations involving sovereignty land see *Bryant v. Peppe*, 238 So. 2d 836 (Fla. 1970); *Gies v. Fischer*, 146 So. 2d 361 (Fla. 1962); *Trustees of the Internal Improvement Fund v. Lobeau*, 127 So. 2d 98 (Fla. 1961); *Trustees of the Internal Improvement Fund v. Claughton*, 86 So. 2d 775 (Fla. 1956). See also *Trustees of the Internal Improvement Fund v. Bass*, 67 So. 2d 433 (Fla. 1953) (swamp and overflow land); *Daniell v. Sherrill*, 48 So. 2d 736 (Fla. 1950); *Jefferson Nat'l Bank v. Metropolitan Dade County*, 271 So. 2d 207 (Fla. 3d Dist. Ct. App. 1972).

163. In *Kean v. Calumet Canal & Improvement Co.*, 190 U.S. 452 (1903), the Court refused to reopen the issue decided in *Hardin v. Jordan*, 140 U.S. 371 (1891). Mr. Justice Holmes' opinion for the Court observed: "Probably in most cases the statute of limitations has cured the defects of title which those cases may have shown." 190 U.S. at 460.

164. See *City of Los Angeles v. Borax Consol., Ltd.*, 102 F.2d 52 (9th Cir.), cert. denied, 307 U.S. 644 (1939) (estoppel was based on state law).

165. See note 100 *supra*.

166. See notes 97-99 and accompanying text *supra*.

167. *Miller v. Bay-To-Gulf, Inc.*, 193 So. 425 (Fla. 1940). The *Miller* court held: "By the latter terms or phrases ["ordinary high-water mark" and "ordinary high tide"] is meant the limit reached by the daily ebb and flow of the tide, the usual tide, or the neap tide that happens between the full and change of the moon." *Id.* at 428. In support of its conclusion the court cited *Teschemacher v. Thompson*, 18 Cal. 11 (1861), and Lord Hale's *DE JURE MARIS*. By juxtaposing "daily ebb and flow" with "neap tide," a twice monthly occurrence, the Florida Supreme Court's rule in *Miller* seems as ambiguous as Lord Hale's original rule. See notes 138 & 139 and accompanying text *supra*. Professor Maloney concludes that "the Florida Supreme Court apparently defines neap tides as all the tides that occur between the full and change of the moon." F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at 76.

168. The meaning of the "mean high water line" provision of the Florida constitution is discussed at notes 242-50, 277-78 and accompanying text *infra*.

theoretically possible to project the line of mean high water onto the shore. The National Ocean Survey's<sup>169</sup> (NOS) primary method of determining the mean high-water line—approved and adopted by the Supreme Court in *Borax*—involves an engineering process of vertical and horizontal measurement. First of all, the vertical rise and fall of the tide is constantly monitored and measured either by reference to a graduated tide staff or by an automatic tide gauge.<sup>170</sup> After a period of observation—ideally nineteen years<sup>171</sup>—vertical reference points, known as tidal datums,<sup>172</sup> are computed for critical water elevations such as mean sea level, half-tide level, mean high water, mean low water, lower low water and higher high water.<sup>173</sup> Mean high water, for example, is “based directly on the average of the high waters over a 19-year period.”<sup>174</sup> Once this tidal datum for mean high water is computed,<sup>175</sup> a horizontal plane, known as a tidal datum plane, is projected through it toward the shore.<sup>176</sup> The mean high-water line is delineated by the intersection of this horizontal plane with the sloping shore.<sup>177</sup> Thus the legal boundary between private uplands and public sovereignty lands would be established.

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169. Formerly the U.S. Coast and Geodetic Survey.

170. See H. MARMER, *supra* note 106, at 23-28.

171. See note 155 and accompanying text *supra*.

172. See U.S. COAST AND GEODETIC SURVEY, SPEC. PUB. NO. 228, TIDE AND CURRENT GLOSSARY 9 (rev. ed. 1949).

173. H. MARMER, *supra* note 106, at 127.

174. *Id.* at 87.

175. In computing tidal datums it has been observed that the actual height of the water is often greater than the height of the tide. This is due to the fact that, in addition to the tide-producing forces, water level is influenced by stationary wave oscillations known as seiches. *Id.* at 39. Seiches are brought about by such agencies as heavy winds, sudden variations in barometric pressure, and seismic waves due to seaquakes. *Id.*

The U.S. Coast and Geodetic Survey first became aware of seiches in 1926 when they were observed in Los Angeles harbor. As a consequence, the Coast and Geodetic Survey opted to ignore the influence of seiches by lowering its estimate of mean high tide in Los Angeles harbor by 0.4 feet. *City of Los Angeles v. Borax Consol., Ltd.*, 20 F. Supp. 69, 71 (S.D. Cal. 1937). On remand of the *Borax* case from the Supreme Court, the federal district court agreed that such an adjustment for seiches is the “correct practice.” *Id.* At present, the NOS continues to compute tidal datums by making adjustments to eliminate seiches. See H. MARMER, *supra* note 106, at 41-42.

176. I A. SHALOWITZ, *supra* note 104, at 89.

177. Because of seiche, note 175 *supra*, the actual wash of mean high water will often reach higher on the shore than the mean high-tide line. For this reason, the practice of eliminating seiche when computing tidal datum planes has been criticized by Professor Corker as not resulting in realistic shore boundaries: “Why should seiche be ignored? . . . We would suppose that land regularly washed by seiche is no more ‘dry or maniorable,’ than land regularly washed by tide. Plants do not know the difference, and neither, prior to 1926, did the Coast and Geodetic Survey.” Corker, *supra* note 94, at 64-65. The Fifth Circuit has replied to such an argument by noting the uncertainty of boundaries determined by wind-driven waves: “There would be no certainty as to the

Unfortunately, the theoretical purity of the NOS method is tainted by several practical problems. One of these problems is that primary (nineteen year) determinations of mean high water are practicable and available at relatively few places.<sup>178</sup> This deficiency can usually be remedied to a satisfactory degree by the use of less accurate methods of tidal datum plane computation. One method, known as comparison of simultaneous observations, involves a comparison of short term tidal observations at the area in question with tidal data from the nearest primary tide station.<sup>179</sup> A second method, known as correction by tabular values, involves the application of theoretical mathematics to short term tidal observation at the area in question.<sup>180</sup>

Two other practical problems of legal consequence beset the tidal datum plane method of boundary demarcation: (1) what happens to the legal boundary when the shoreline shifts; (2) where is the legal boundary if the shoreline itself is difficult to locate.

*1. Ambulatory Versus Fixed Boundaries.*—As a practical matter, shorelines do not remain stable. Due to the influence of wind, water, cataclysm or man, the contour of the shore is constantly shifting. As a consequence, the imaginary mean high-water line shifts accordingly: if the shore advances, the mean high-water line will recede; if the shore recedes, the mean high-water line will advance. The legal question which arises from this ambulatory character of the shoreline is whether the legal boundary should shift also. In Florida, as in most jurisdictions, the answer to this question may vary depending upon whether the shoreline changes were brought about by natural or artificial forces and whether the changes occurred gradually or suddenly. There are four general categories of shoreline change—accretion, reliction, erosion and avulsion. Each of these categories has developed its own body of case law.

*a. Accretion.*—Accretion is the gradual and imperceptible build-up of soil or silt on riparian land by action of the contiguous waters.<sup>181</sup> Thus land is created where there once was water. The critical requirement in accretion is that the build-up be “gradual and imperceptible.”

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upland boundary of the shore if we took into consideration points to which sea water is driven by the wind. . . . The tide is another matter; there is nothing erratic about it.” *Humble Oil & Ref. Co. v. Sun Oil Co.*, 190 F.2d 191, 195 (5th Cir. 1951), *cert. denied*, 342 U.S. 920 (1952).

178. H. MARMER, *supra* note 106, at 87.

179. *Id.* at 88-90.

180. *Id.* at 90-95.

181. *Board of Trustees of the Internal Improvement Trust Fund v. Medeira Beach Nominee, Inc.*, 272 So. 2d 209 (Fla. 2d Dist. Ct. App. 1973); *Mexico Beach Corp. v. St. Joe Paper Co.*, 97 So. 2d 708 (Fla. 1st Dist. Ct. App. 1957); *see Nebraska v. Iowa*, 143 U.S. 359 (1892); *Crow v. Johnston*, 194 S.W.2d 193 (Ark. 1946).

If it is not, the process is not accretion.<sup>182</sup> "The test as to what is gradual and imperceptible is, that though witnesses may see from time to time that progress has been made, they could not perceive it while the process was going on."<sup>183</sup> Technically, the term "accretion" refers to the building-up process, while the term "alluvion" refers to the deposit itself.<sup>184</sup>

Florida follows the common law rule that the benefit of accretion inures to the contiguous riparian owner,<sup>185</sup> regardless of who owns the bed of the waterbody.<sup>186</sup> Thus the riparian owner's boundary would shift seaward with the new mean high-water line. The doctrine of accretion is supported by several rationales. One derives from the Roman theory of accession, which is the right of an owner to all things that his property produces.<sup>187</sup> Thus, just as the owner of a tree is entitled to the fruit and the owner of a cow is entitled to the calves, so the owner of waterfront land is entitled to accretions.<sup>188</sup> Another rationale for the accretion doctrine was supplied by Blackstone: "And as to lands gained from the sea, either by *alluvion*, by the washing up of land and earth, so as in time to make *terra firma* . . . [and] if this gain be by little and little, by small and imperceptible degrees, it shall go [to] the owner of the land adjoining . . . [because of] *de minimus non curat lex* . . ." <sup>189</sup> The *de minimus* rationale is not entirely convincing because

182. 2 A. SHALOWITZ, *supra* note 104, at 537.

183. Board of Trustees of the Internal Improvement Trust Fund v. Medeira Beach Nominee, Inc., 272 So. 2d 209, 211 (Fla. 2d Dist. Ct. App. 1973); *accord*, County of St. Clair v. Lovington, 90 U.S. (23 Wall.) 46 (1874).

184. 2 A. SHALOWITZ, *supra* note 104, at 537.

185. Board of Trustees of the Internal Improvement Trust Fund v. Medeira Beach Nominee, Inc., 272 So. 2d 209 (Fla. 2d Dist. Ct. App. 1973); Mexico Beach Corp. v. St. Joe Paper Co., 97 So. 2d 708 (Fla. 1st Dist. Ct. App. 1957). Apparently, the rule that accretion belongs to the upland owner is followed in all states except Louisiana, which "recognizes the accretion rule as to rivers (including tidal rivers) but not as to lakes or the ocean." Corker, *supra* note 94, at 76; *see* Comment, *Alluvion, Islands, and Sand Bars*, 47 TUL. L. REV. 367, 374 (1973).

186. Welles v. Bailey, 10 A. 565 (Conn. 1887); Peuker v. Canter, 63 P. 617 (Kan. 1901); Yearsley v. Gipple, 175 N.W. 641 (Neb. 1919).

187. *See* County of St. Clair v. Lovington, 90 U.S. (23 Wall.) 46, 69 (1874); Saulet v. Shepherd, 71 U.S. (4 Wall.) 502, 508 (1866); Manry v. Robinson, 56 S.W.2d 438, 442 (Tex. 1932); R. SOHM, *THE INSTITUTES* 323 (3d ed. J. Ledlie transl. 1907).

188. The Supreme Court has stated:

The riparian right to future alluvion is a vested right. It is an inherent and essential attribute of the original property. The title to the increment rests in the law of nature. It is the same with that of the owner of a tree to its fruits, and of the owner of flocks and herds of their natural increase. The right is a natural, not a civil one.

County of St. Clair v. Lovington, 90 U.S. (23 Wall.) 46, 68-69 (1874). *See also* Saulet v. Shepherd, 71 U.S. (4 Wall.) 502, 508 (1866).

189. 2 W. BLACKSTONE, *COMMENTARIES* \*261-62.

accretions can often be quite substantial. A third rationale, also recognized by Blackstone, is that of compensation. Since a riparian owner often loses land by the process of erosion, any "possible gain is therefore a reciprocal consideration for such possible . . . loss."<sup>190</sup> The most important policy behind the accretion rule, however, is probably that of preserving the riparian right of access to water.<sup>191</sup>

In Florida, courts have distinguished between those accretions which build up on land and move seaward from those which build up in the sea, progress landward and eventually connect with the mainland. The former situation is the usual one, to which the traditional rule applies. In regard to the latter situation, it was held in *Siesta Properties, Inc. v. Hart*<sup>192</sup> that "in order for an owner of land bounding upon water to claim additions to such land as accretion, such accretion must begin upon the land of such riparian owner and not upon some other place from which it may eventually extend until it reaches the claimant's land."<sup>193</sup>

Complications are introduced into the traditional doctrine of natural accretion when the build-up of alluvion is partially or solely caused by man. Where jetties or breakwaters have been built, for example, gradual and imperceptible deposits of alluvion may "naturally" accrete due to these artificial structures. Where the upland owner himself has built these artificial structures it is generally held that he cannot claim title to the resultant alluvion.<sup>194</sup> The reason given in support of this rule has been stated to be that "to permit the riparian owner to cause accretion himself would be tantamount to allowing him to take state

190. *Id.* at \*262.

191. *See* *Lamprey v. Metcalf*, 53 N.W. 1139, 1142 (Minn. 1893), stating:

The incalculable mischiefs that would follow if a riparian owner is liable to be cut off from access to the water, and another owner sandwiched in between him and it, whenever the water line had been changed by accretions or relictions, are self-evident, and have been frequently animadverted on by the courts.

192. 122 So. 2d 218 (Fla. 2d Dist. Ct. App. 1960).

193. *Id.* at 221 (quoting from the trial court opinion); *see* *Sidener v. City of Pensacola*, 13 Fla. Supp. 120 (Escambia County Cir. Ct. 1958). The accretion rule in *Siesta Properties* and *Sidener* has been recognized as logically acceptable:

The logic . . . becomes clearer when it is pointed out that any accretions beginning out in the water would form an island. At this point title is typically in the state. There is no reason to divest the state of its title merely because the island subsequently is connected to the mainland. The property thus formed is divided at the point where the two bodies of land meet.

F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at 387 (footnote omitted).

194. *Board of Trustees of the Internal Improvement Trust Fund v. Medeira Beach Nominee, Inc.*, 272 So. 2d 209 (Fla. 2d Dist. Ct. App. 1973); *Brundage v. Knox*, 117 N.E. 123 (Ill. 1917); *State ex rel. McKay v. Sause*, 342 P.2d 803 (Ore. 1959). *Contra*, *Roberts v. Brooks*, 78 F. 411 (2d Cir. 1897); *Grant v. Fletcher*, 283 F. 243, 269-70 (E.D. Mich. 1922).

land."<sup>195</sup> On the other hand, where a third party has built the artificial structures it is generally held the accretions inure to the upland owner.<sup>196</sup> The reason for this rule, as stated by the United States Supreme Court, is that "[t]he 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."<sup>197</sup>

When riparian land is built up directly by dredging and filling, the process is not really accretion because it is neither gradual nor imperceptible. In Florida, of course, such a project would now require the purchase of the adjacent sovereignty land, the establishment of a bulkhead line and the acquisition of a dredge and fill permit before title to such fill could legally vest in the riparian owner.<sup>198</sup> In other jurisdictions, a riparian owner ordinarily cannot claim title to land which he "reclaimed" by the filling in of the publicly-owned bed of a navigable waterbody.<sup>199</sup> Similarly, a riparian proprietor ordinarily cannot claim title to reclaimed land where the state or its grantee, as owner of the bed, has filled in the submerged land.<sup>200</sup> This is so even though the riparian character of the owner's upland may be extinguished. In some jurisdictions, however, it is required that land reclaimed by the state be an integral part of a navigational project; otherwise title to the fill will inure to the upland owner in order to preserve his riparian rights.<sup>201</sup>

*b. Reliction.*—Reliction is the term applied to land which has become permanently uncovered by imperceptible recession of the water.<sup>202</sup> Reliction might occur, for example, by a lowering of sea level or, in the case of a lake, by a drying-up of the bed. As in the case of accretion, the process of reliction must be gradual and imperceptible.

195. *Board of Trustees of the Internal Improvement Trust Fund v. Medeira Beach Nominee, Inc.*, 272 So. 2d 209, 212 (Fla. 2d Dist. Ct. App. 1973).

196. *County of St. Clair v. Lovington*, 90 U.S. (23 Wall.) 46 (1874); see *Krimlofski v. Matters*, 119 N.W.2d 501 (Neb. 1963); *Seacoast Real Estate Co. v. American Timber Co.*, 104 A. 437 (N.J. Ch. 1918); *State ex rel. McKay v. Sause*, 342 P.2d 803 (Ore. 1959). In California a different rule is applied. Accretions added because of artificial structures are treated as artificial in character and, as against the state or its grantee, the riparian owner is not entitled to claim such accretion. *Carpenter v. City of Santa Monica*, 147 P.2d 964 (Cal. Dist. Ct. App. 1944). See also *City of Los Angeles v. Anderson*, 275 P. 789 (Cal. 1929).

197. *County of St. Clair v. Lovington*, 90 U.S. (23 Wall.) 46, 66 (1874).

198. See notes 65-81 and accompanying text *supra*.

199. See, e.g., *Burns v. Forbes*, 412 F.2d 995 (3d Cir. 1969); *Carli v. Stillwater St. Ry. & Transfer Co.*, 10 N.W. 205 (Minn. 1881); *State ex rel. McKay v. Sause*, 342 P.2d 803 (Ore. 1959).

200. See, e.g., *United States v. California*, 381 U.S. 139, 177 (1965).

201. *Michaelson v. Silver Beach Improvement Ass'n*, 173 N.E.2d 273 (Mass. 1961). See also *State v. Gill*, 66 So. 2d 141 (Ala. 1953).

202. *Martin v. Busch*, 112 So. 274, 287 (Fla. 1927).

Moreover, temporary subsidence of the water due to the seasons does not constitute reliction.<sup>203</sup>

The law of reliction is generally the same as that of accretion; title to the newly formed land inures to the upland owner.<sup>204</sup> Thus the upland owner's boundary would shift seaward with the mean high-water line. Florida courts, however, have recognized an exception to the traditional reliction doctrine in the case of artificial reliction caused by drainage operations. In *Martin v. Busch*<sup>205</sup> a riparian owner was claiming title to lands that had been uncovered in the bed of Lake Okeechobee by governmental drainage operations. The Florida Supreme Court recognized that the bed of Lake Okeechobee was sovereignty land and held that "the lands so uncovered below such [ordinary] high-water mark, continue to belong to the State."<sup>206</sup> Thus, "the doctrine of reliction . . . does not apply where land is reclaimed by governmental agencies as by drainage operations."<sup>207</sup>

*c. Erosion.*—Erosion is the gradual and imperceptible wearing away of land by the contiguous waters.<sup>208</sup> The rule which operates in favor of a riparian owner in the case of accretion and reliction, by increasing his land, operates against him in the case of erosion; the loss of land falls upon the riparian owner and the gain inures to the state.<sup>209</sup> Thus the riparian owner's boundary line would shift landward with the mean high-water line.

*d. Avulsion.*—Whereas accretion, reliction and erosion are all gradual and imperceptible processes, avulsion is the "rapid, easily perceived, and sometimes violent, shifts of land incident to floods, storms or channel breakthroughs."<sup>210</sup> In contrast to the traditional rules of accretion, reliction and erosion, it is usually stated that avulsive shifts do not change legal boundary lines.<sup>211</sup>

The issue in an avulsion case is usually whether the geological metamorphosis was in fact caused by (sudden) avulsion or instead by (im-

203. 2 A. SHALOWITZ, *supra* note 104, at 538.

204. *Padgett v. Central & S. Fla. Flood Control Dist.*, 178 So. 2d 900, 904 (Fla. 2d Dist. Ct. App. 1965); *see* *Martin v. Busch*, 112 So. 274, 287 (Fla. 1927).

205. 112 So. 274 (1927).

206. *Id.* at 287.

207. *Id.*; *accord*, *Padgett v. Central & S. Fla. Flood Control Dist.*, 178 So. 2d 900 (Fla. 2d Dist. Ct. App. 1965).

208. *See* *Municipal Liquidators, Inc. v. Tench*, 153 So. 2d 728 (Fla. 2d Dist. Ct. App. 1963); *Siesta Properties, Inc. v. Hart*, 122 So. 2d 218, 223-24 (Fla. 2d Dist. Ct. App. 1960).

209. *Siesta Properties, Inc. v. Hart*, 122 So. 2d 218 (Fla. 2d Dist. Ct. App. 1960).

210. *Bauman v. Choctaw-Chickasaw Nations*, 333 F.2d 785, 789 (10th Cir. 1964), *cert. denied*, 379 U.S. 965 (1965).

211. *Bryant v. Peppe*, 238 So. 2d 836, 837 (Fla. 1970); *Municipal Liquidators, Inc. v. Tench*, 153 So. 2d 728, 730 (Fla. 2d Dist. Ct. App. 1963); *Siesta Properties, Inc. v. Hart*, 122 So. 2d 218, 224 (Fla. 2d Dist. Ct. App. 1960).

perceptible) accretion or erosion.<sup>212</sup> In Florida this question is one for the trier of fact to determine.<sup>213</sup> Furthermore, in Florida there is a presumption of erosion or accretion over avulsion,<sup>214</sup> with the result that the burden of proof is on the party alleging avulsion.<sup>215</sup>

The rule that avulsion does not change legal boundaries is clearest when applied to sudden shifts in the course of a river. In the case of *Nebraska v. Iowa*<sup>216</sup> the Missouri River, which had been the legal boundary between the two states, suddenly shifted its bed at a spot above Omaha. The issue was whether the boundary followed the new course of the river or remained in the old dried-up bed. Deeming the shift avulsion rather than accretion, the Supreme Court held:

It is . . . well settled, that where a stream, which is a boundary, from any cause suddenly abandons its old and seeks a new bed, such change of channel works no change of boundary; and that the boundary remains as it was, in the centre of the old channel, although no water may be flowing therein.<sup>217</sup>

Application of the avulsion rule is not so apparent in the case where a portion of *A*'s riparian land is suddenly torn up and deposited next to the riparian land of *B*. It does seem clear that the avulsion rule applies to *B* to the effect that he cannot enlarge his boundaries by taking title to the newly deposited earth.<sup>218</sup> What is not clear is the legal position of *A*. Does his legal boundary shift so that he retains title to the displaced land at its new location, or does he lose title altogether? Moreover, if *A* does lose title, and since *B* is precluded by the avulsion rule from acquiring it, who does hold title to the displaced land? The applicable Florida case has been aptly analyzed as follows:

In *Siesta Properties, Inc. v. Hart* the Florida Second District Court of Appeal found that the evidence established that a hurricane caused the great bulk of the plaintiff's soil to be torn away from his

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212. See, e.g., *Nebraska v. Iowa*, 143 U.S. 359 (1892); *Siesta Properties, Inc. v. Hart*, 122 So. 2d 728 (Fla. 2d Dist. Ct. App. 1960).

213. *Municipal Liquidators, Inc. v. Tench*, 153 So. 2d 728, 731 (Fla. 2d Dist. Ct. App. 1963).

214. *Id.*

215. *Id.*

216. 143 U.S. 359 (1892).

217. *Id.* at 361.

218. See *Bryant v. Peppe*, 238 So. 2d 836 (Fla. 1970); *Siesta Properties, Inc. v. Hart*, 122 So. 2d 218 (Fla. 2d Dist. Ct. App. 1960); *Nolte v. Sturgeon*, 376 P.2d 616 (Okla. 1962); *Mapes v. Neustadt*, 173 P.2d 442 (Okla. 1946) Application of the avulsion rule in such a situation may have the effect of cutting off *B*'s riparian rights since he may no longer own waterfront land.



island and to be deposited on the bed of a tidal pass, adjacent to the island of the defendant. This constituted avulsion. On these facts the district court took the position that plaintiff could not enlarge his property lines beyond their original boundaries, or claim title to the land in its new location. Since the land was within the boundaries neither of plaintiff's property nor of defendant's, title was in the state as owner of the bed. This holding suggests that a riparian owner will lose title to the avulsion unless he owns the bed where the soil is deposited. In order to acquire ownership of tidal beds in Florida today, the riparian owner generally must comply with the provisions of the Bulkhead Act . . . . Since in many instances this would not have been done, when bodies of Florida tidal land are suddenly moved by natural forces the owner will apparently lose title, and the gain will accrue to the state.<sup>219</sup>

Thus, since *A* loses title to the displaced land, he is left with his original riparian parcel—diminished in size by the avulsion. Where once the displaced land lay, there now would be sea. Since this “new” submerged land would vest in the state, the boundary of *A*'s original parcel must shift in accordance with the new mean high-water line. This conclusion would seem to be the only logical one, although it does not comport literally with the rule that avulsion does not change legal boundary lines.

From the foregoing discussion of accretion, reliction, erosion and avulsion it can be seen that Florida case law adheres to the concept of an ambulatory boundary; *i.e.*, a riparian owner's legal boundary will generally shift with the mean high-water line in accordance with changes in the contour of the shore. The only Florida exceptions to this general rule may occur in the following situations: accretions that initially begin out in the water and move landward;<sup>220</sup> accretions artificially induced by the riparian owner himself;<sup>221</sup> fill deposited by the riparian owner himself;<sup>222</sup> fill deposited by the state (for a navigational purpose);<sup>223</sup> relictions caused by public drainage operations;<sup>224</sup> and avulsion resulting in the deposit of displaced land adjacent to an owner's riparian property (the hypothetical *B* situation).<sup>225</sup>

219. F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at 393 (footnote omitted).

220. See note 193 and accompanying text *supra*.

221. See notes 194 & 195 and accompanying text *supra*.

222. See note 199 and accompanying text *supra*.

223. See notes 200 & 201 and accompanying text *supra*.

224. See notes 205-07 and accompanying text *supra*. It is arguable that the artificial reliction rule announced in *Martin v. Busch*, 112 So. 274 (Fla. 1927), is limited to drainage operations in fresh water lakes. Regardless of the legal scope of the rule, as a practical matter it would not apply to coastal waters since the state is not likely to engage in drainage of the navigable sea.

225. See notes 218 & 219 and accompanying text *supra*.

It is arguable that recognition of an ambulatory upland/sovereignty land boundary line in Florida is compelled by *Borax* and the later Supreme Court decision in *Hughes v. Washington*.<sup>226</sup> *Borax* announced the rule that federal law controls in any tidal boundary case where a federal question is involved, by declaring:

The question as to the extent of this federal grant, that is, as to the limit of the land conveyed, or the boundary between the upland and the tideland, is necessarily a federal question. It is a question which concerns the validity and effect of an act done by the United States; it involves the ascertainment of the essential basis of a right asserted under federal law.<sup>227</sup>

This statement by the *Borax* Court raises two important questions. First, what type of boundary case is it that raises a federal question? Secondly, what is the controlling federal law that is to be applied in these federal question cases?

Both of these questions may have been answered in *Hughes v. Washington*.<sup>228</sup> The issue in *Hughes* was whether the petitioner, successor in title to littoral property conveyed by a federal grant made before Washington became a state, was entitled to alluvion that had accreted to her land after Washington became a state. The issue was raised because the Washington constitution denied owners of ocean-front property any right to accretions that formed after statehood.<sup>229</sup> In

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226. 389 U.S. 290 (1967).

227. 296 U.S. 10, 22 (1935).

228. 389 U.S. 290 (1967).

229. Article XVII, section 1, of the Washington constitution, unchanged since its adoption in 1889, provided: "The state of Washington asserts its ownership to the beds and shores of all navigable waters in the state up to and including the line of ordinary high tide, in waters where the tide ebbs and flows. . . ." See *Hughes v. State*, 410 P.2d 20 (Wash. 1966). In an earlier case the Washington Supreme Court had interpreted "ordinary high tide" to be "that line which the water impresses on the soil by covering it for sufficient periods to deprive the soil of vegetation and destroy its value for agricultural purposes." *Harkins v. Del Pozzi*, 310 P.2d 532, 534 (Wash. 1957). Thus, by constitutional construction, Washington's sovereignty land boundary was a "vegetation line," which, of course, would not be affected by accretions to the shore. See *Corker, supra* note 94.

In *Hughes* the Washington Supreme Court held *Borax* to be inapplicable because it did "not involve the question of accretion." *Hughes v. State*, 410 P.2d 20, 29 (Wash. 1966). Furthermore, the court refused to apply federal boundary rules because they "do not override the established rules of property of the sovereign state in a controversy between it and one of its citizens." *Id.* Thus the court, basing its decision on the "state's constitutional assertion of ownership in 1889," held: "The property line is the line of ordinary high tide, which we equate to mean high tide on [November 11, 1889]. Littoral rights of upland owners were terminated. . . . All accretion subsequent to November 11, 1889 is owned by the state. . . ." *Id.*

concluding that the case presented a federal question the *Hughes* Court relied on the above-quoted passage from *Borax*, and stated:

No subsequent case in this Court has cast doubt on the principle announced in *Borax*. . . . [*Borax* involved] the question as to what rights were conveyed by the federal grant and decided that the *extent of ownership* under the federal grant is governed by federal law. This is as true whether doubt as to any boundary is based on a broad question as to the general definition of the shoreline or on a particularized problem relating to the ownership of accretion.<sup>230</sup>

The *Hughes* Court recognized that *Borax* involved a federal patent issued after statehood whereas the case at bar involved a federal patent issued before statehood.<sup>231</sup> Nevertheless, the Court declared that "[W]e . . . find no significant difference between *Borax* and the present case."<sup>232</sup> Thus, the rule announced in *Hughes* must be that whenever a case involves riparian land originating from a federal patent, regardless of whether the patent was issued before or after statehood, the location of the boundary line ("extent of ownership") is governed by federal law.<sup>233</sup>

The next question is what is the applicable federal law. *Borax* held that the ordinary high-water mark was to be determined by taking the mean of all the high tides over an 18.6 year period.<sup>234</sup> Since the boundary between upland and sovereignty land is delineated by the intersection of this mean high-tide datum plane and the shore,<sup>235</sup> an ambulatory rather than a fixed boundary surely must have been contemplated by the *Borax* Court.

230. 389 U.S. at 292 (emphasis added).

231. *Id.*

232. *Id.*

233. *Cf.* *United States v. Oregon*, 295 U.S. 1, 27-28 (1935), stating:

The laws of the United States alone control the disposition of title to its lands. The States are powerless to place any limitation or restriction on that control. . . . The construction of grants by the United States is a federal not a state question . . . and involves the consideration of state questions only insofar as it may be determined as a matter of federal law that the United States has impliedly adopted and assented to a state rule of construction as applicable to its conveyances.

It is apparent from this quote that federal law could "adopt" or "assent to" a state property rule. *Hughes*, also, has language to the same effect: "*Borax* itself, as well as *United States v. Oregon* . . . makes clear that . . . the Federal Government may, if it desires, choose to select a state rule [of title to lands] as the federal rule." 389 U.S. at 292-93. The *Hughes* Court then declared: "*Borax* holds that there has been *no such choice in this area*, and we have no difficulty in concluding that *Borax* was correctly decided." *Id.* at 293 (emphasis added).

234. See notes 152 & 154 and accompanying text *supra*.

235. See notes 169-77 and accompanying text *supra*.

The *Hughes* Court directly addressed the question of applicable federal law with respect to the issue of accretion:

This brings us to the question of what the federal rule is. . . . A long and unbroken line of decisions of this Court establishes that the grantee of land bounded by a body of navigable water acquires a right to any natural and gradual accretion formed along the shore. . . . Any other rule would leave riparian owners continually in danger of losing the access to water . . . and continually vulnerable to harassing litigation challenging the location of the original water lines.<sup>236</sup>

Thus the "federal rule" recognizes that accretion inures to the upland owner. Logically, the federal rule should also recognize the doctrines of erosion, reliction and avulsion; nonrecognition of these doctrines would leave riparian owners as equally in danger of "losing access to water" or equally vulnerable to "harassing litigation" as would nonrecognition of accretion. As a matter of fact, it is well established that federal law does recognize the doctrines of erosion,<sup>237</sup> reliction<sup>238</sup> and avulsion.<sup>239</sup> Under *Hughes*, therefore, it is arguable that supreme federal law requires that states recognize ambulatory boundaries for all riparian lands which originated from a federal grant; and, under *Borax*, that this ambulatory boundary be demarcated by the mean high-tide line. Since virtually all of Florida was carved from the federal domain,<sup>240</sup> it is possible that all of Florida's coastline is subject to the *Hughes-Borax* rule under the supremacy clause<sup>241</sup> of the federal Constitution.

It is also arguable that riparian boundary lines in Florida are mandated to be ambulatory by the state constitution. Article X, section 11, of the present Florida constitution declares: "The title to lands under navigable waters, within the boundaries of the state, . . . *including beaches below mean high water lines*, is held by the state . . . in trust for all the people." The Florida constitution therefore adopts the

236. 389 U.S. at 293-94.

237. *Jefferis v. East Omaha Land Co.*, 134 U.S. 178, 189 (1890); *County of St. Clair v. Lovington*, 90 U.S. (23 Wall.) 46, 69 (1874); *Banks v. Ogden*, 69 U.S. (2 Wall.) 57, 67 (1864); *City of New Orleans v. United States*, 35 U.S. (10 Pet.) 446, 486 (1836).

238. *Jefferis v. East Omaha Land Co.*, 134 U.S. 178, 192-93 (1890); *The Schools v. Riskey*, 77 U.S. (10 Wall.) 91, 110 (1869); *Jones v. Johnston*, 59 U.S. (18 How.) 150, 156 (1855).

239. *Nebraska v. Iowa*, 143 U.S. 359 (1892).

240. Except for Spanish land grants prior to the treaty of 1819 between Spain and the United States, Florida was carved out of federal territory in 1845. See note 12 and accompanying text *supra*.

241. U.S. CONST. art. VI.

mean high-water line, at least as to "beaches,"<sup>242</sup> as the boundary between private upland and public sovereignty land. Since Florida courts, by recognizing the doctrines of accretion, reliction, erosion and avulsion, have always deemed riparian boundaries to be ambulatory, and since the "mean high water" provision of the constitution arguably must be interpreted under compulsion of the *Hughes-Borax* rule of ambulatory boundaries, it is likely that the Florida constitution specifies a riparian boundary line of ambulatory character.

It is important to discover whether supreme federal law or the 1968 Florida constitution mandate ambulatory coastal boundaries because the Florida Legislature has, in a limited instance, provided for fixed coastal boundaries.<sup>243</sup> The Beach and Shore Preservation Act<sup>244</sup> makes provision for the establishment of an erosion control line along any beach that has been or will be destroyed by severe erosion.<sup>245</sup> An approved<sup>246</sup> survey, showing the area of beach to be restored and the location of the erosion control line, must be recorded by the Board of Trustees.<sup>247</sup> Upon recordation of the survey, title to all lands seaward of the erosion control line are deemed to be vested in the state and title to all lands landward of the line are deemed to be vested in the riparian upland owners.<sup>248</sup> Most significantly, once the erosion control line has been established, "the common law shall no longer operate to increase or decrease the proportions of any upland property lying landward of such line, either by accretion or erosion or by any other natural or artificial process . . . ."<sup>249</sup> Thus the legislature, by prospectively abolishing the doctrines of accretion, reliction, erosion and avulsion on beaches that qualify for restoration projects, has set fixed and permanent coastal boundaries for these beaches.

However worthy the goal of beach restoration, it would seem that

242. For a discussion of whether the "mean high water" provision of the Florida constitution applies only to beaches see note 278 *infra*.

243. Judicial establishment of fixed boundary lines is discussed at notes 255-81 and accompanying text *infra*.

244. FLA. STAT. ch. 161 (1971).

245. FLA. STAT. § 161.161 (b) (1971).

246. Provision is made for a public hearing to receive evidence on the proposed restoration project and on the proposed survey locating the erosion control line. FLA. STAT. § 161.161 (2) (1971). Provision is also made for review in the circuit courts of the Trustees' decision to authorize the restoration project and the erosion control line. FLA. STAT. § 161.171 (1971).

247. FLA. STAT. § 161.181 (1971).

248. FLA. STAT. § 161.191 (1) (1971).

249. FLA. STAT. § 161.191 (2) (1971). The act goes on to provide that the doctrine of accretion, erosion, reliction and avulsion will again become operative if the local authority fails to maintain the restored beach and it recedes to a point landward of the erosion control line. FLA. STAT. § 161.211 (2) (1971).

legislative determination of a fixed boundary line runs counter to the mandates of the Florida constitution and of the assumedly applicable *Hughes-Borax* rule. The constitution clearly declares that the boundary between public sovereignty land and private upland on beaches is the (implicitly ambulatory) mean high-water line. Thus the setting of fixed boundary lines on beaches would deprive a riparian upland owner of his constitutional right to gains by accretion and reliction.<sup>250</sup> Furthermore, it follows from *Hughes* that the State of Florida can no more abrogate the doctrine of accretion by statutory provision than could the State of Washington by constitutional provision.

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250. Although the act establishes a fixed erosion control line as the coastal boundary in lieu of the ambulatory mean high-water line, it does provide that the "upland owner . . . shall . . . continue to be entitled to all common law riparian rights except [accretion, etc.], including but not limited to rights of ingress, egress, view, boating, bathing, and fishing." FLA. STAT. § 161.201 (1971). In the case of "ordinary" common law property rights, such as riparian rights, this provision might be sufficient to save the statute from a substantive due process "taking" attack. See *Thiesen v. Gulf, F. & A. Ry.*, 78 So. 491 (1918) (riparian rights are property which cannot be taken by the state without just compensation). The right to gain by accretion and reliction, however, is now more than a "common law" right in Florida; it is a constitutional right, inherent in the constitutional mandate that the mean high-water line be the coastal boundary. Thus, under this analysis, the legislature has no more power to deprive a riparian owner of his constitutional right to a mean high-water line boundary than it has to deprive him of his constitutional right to homestead exemption. See FLA. CONST. art. VII, § 6.

No case has yet tested the constitutionality of the erosion control line provision of the Beach and Shore Preservation Act. However, in a recent decision, Board of Trustees of the Internal Improvement Trust Fund v. *Medeira Beach Nominee, Inc.*, 272 So. 2d 209 (Fla. 2d Dist. Ct. App. 1973), the court evidenced a strong disinclination against state interference with the accretion doctrine. In *Madeira Beach* 115 feet of alluvion had accreted in front of a riparian owner's property as a result of groins that had been erected in furtherance of a public erosion control and beach stabilization program. The issue in the case was whether "a strip of accreted land become[s] the property of the upland riparian owner even where the accretion is the result of a lawful exercise of the police power by a municipality to prevent beach erosion?" *Id.* at 211. Since the restoration project had begun eight years before the Beach and Shore Preservation Act was passed, the court, on retroactivity grounds, refused to consider the erosion control line provision "[e]ven if the statute is constitutional with respect to riparian owners." *Id.* at 214. The court quieted title in the upland owner, stating:

The ordinary high water mark is well established as the dividing line between private riparian and sovereign or public ownership of the land beneath the water. This dividing line was not chosen arbitrarily.

The use of this dividing line has been reaffirmed in *Hughes v. Washington* . . . . It is apparent that the reasoning behind this line is demonstrated in the day to day utilization of the waterfront property by its riparian owner. . . . [T]he daily mark of a high tide on the shore gives both the riparian and the public notice of their possible use of the land on either side of the mark. *Freezing the boundary at a point in time*, such as was done in *Martin v. Busch*, the artificial reliction case] or as is suggested here by the state, not only does damage to all the considerations above but renders the ordinary high water mark useless as a boundary line clearly marking the riparian's rights and the sovereign's rights.

*Id.* at 213 (emphasis added). Thus the court refused to allow title to artificial relictions to inure to the state, but refrained from doing so on state constitutional principles.

2. *Problem Areas: Difficulty in Locating the Mean High-Tide Line.*—As discussed, the mean high-water line is delineated by the intersection of the mean high-tide datum plane with the sloping shore.<sup>251</sup> In a state such as Florida, however, this linear intersection may be difficult or impossible to locate. The first type of problem area is where the slope of the shore is extremely gradual. It is NOS procedure to tabulate high-water levels to the nearest tenth of a foot.<sup>252</sup> Thus, in an area where the shore slopes one hundred horizontal feet for each foot of vertical rise, a one-tenth of a foot vertical margin of error in the computation of the mean high-tide datum plane could result in a ten foot horizontal variance in the location of the mean high-tide line on the shore.<sup>253</sup> An upland owner is not likely to be satisfied with the knowledge that his riparian boundary is subject to a ten foot margin of error.

The second type of problem area is where there is really no sloping "shore" at all. In marsh, mangrove or other areas of dense vegetation the mean high-water line is either obscured or completely impossible to locate. Professors Maloney and Ausness of the University of Florida have identified five such problem areas along the Florida coast:

The first type of problem area is the mangrove area of south Florida. In the coastal mangrove areas there may or may not be a berm near the outer edge of the mangroves. If such a berm does exist, it may be continuous or pierced by openings of greater or lesser magnitude, or it may taper off without fully enclosing the mangrove area. . . .

A second type of area with restrictions which often prevent NOS determination of the mean high-water line is coastal marshlands. In this type of area it may be possible to determine the mean high-water line by photogrammetry. However, photogrammetric techniques [may not provide the required degree of accuracy]. . . .

Areas with meandering tidally-affected drainage creeks present a third mixture of physical and legal problems not resolved on the

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251. See notes 169-77 and accompanying text *supra*.

252. H. MARMER, *supra* note 106, at 86-87.

253. In regard to this margin of error problem, see *Trustees of the Internal Improvement Fund v. Wetstone*, 222 So. 2d 10, 11 (Fla. 1969), stating: "This vertical reference point . . . would be compounded over the course of eight miles to create an excessive tolerance on the almost horizontal plane so that such tolerance would vary from several hundred feet to a quarter of a mile when it reached the Island. The mangrove lands were so gradual in their slope as to be almost flat." See also *City of Los Angeles v. Borax Consol. Ltd.*, 74 F.2d 901, 904 (9th Cir. 1935), stating: "In the case at bar the importance of the location of the exact position of the line of ordinary high water is manifest from the statement by the appellees in their brief that, 'the lowering or raising by one-tenth of a foot may result in the gain or loss of acres . . . .'"

NOS maps. In such areas the legal definition of navigability for title purposes will determine whether the coastal boundary line extends inland along the banks of such creeks or should be projected across their mouths from headland to headland. . . .

The fourth type of problem is evident where a large drainage field meets the coast, with small hammocks scattered through a marshy area. . . .

Finally, there are problems connected with the mapping of the upper reaches of navigable streams as well as some bays and lagoons, where the range of the tides diminishes to the point where tidal effects can no longer be measured with a degree of accuracy acceptable to NOS.<sup>254</sup>

In these problem areas, where mean high-water line demarcation is physically difficult or impossible, it is the legal system which ultimately must resolve the boundary question. Both the Florida Supreme Court and the Florida Legislature have taken cognizance of boundary questions in these problem areas and, to a limited extent, have proffered possible solutions.

*a. Judicial Resolution.*—In *Trustees of the Internal Improvement Fund v. Wetstone*<sup>255</sup> the Florida Supreme Court resolved a boundary dispute by the unprecedented method of declaring the meander line to be the boundary between private upland and public sovereignty land. Meander lines are straight, connected lines which were run along the edge of navigable waterbodies by federal surveyors who were plating the state into rectilinear sections.<sup>256</sup> The purpose of running meander lines was to ascertain the acreage which remained in the "fractional" section.<sup>257</sup> Thus, meander lines ignored the minor sinuosities in the shore<sup>258</sup> by cutting across dry land at some places and across navigable water at others.<sup>259</sup>

The plaintiff in *Wetstone* was the grantee, through mesne conveyances, of swamp and overflow land<sup>260</sup> which had originally been pat-

254. F. Maloney & R. Ausness, *supra* note 100, at 110-12.

255. 222 So. 2d 10 (Fla. 1969).

256. See 2 A. SHALOWITZ, *supra* note 104, at 450-51; F. MALONEY, S. PLAGER & F. BALDWIN, *supra* note 3, at § 22.2 (b).

257. 2 A. SHALOWITZ, *supra* note 104, at 451. A section is a surveying subdivision of 640 acres (one square mile). *Id.* at 450. If the area which would be a section is partially covered by navigable water, it is called a fractional section. *Id.* at 450-51; *South Florida Farms Co. v. Goodno*, 94 So. 672, 675 (Fla. 1922).

258. 2 A. SHALOWITZ, *supra* note 104, at 451.

259. See *Trustees of the Internal Improvement Fund v. Toffel*, 145 So. 2d 737, 742 (Fla. 2d Dist. Ct. App. 1962).

260. See note 49 *supra*.



ented to Florida under the Swamp Land Grant Act of 1850.<sup>261</sup> The issue in the case was "whether, under the circumstances of this case, the meander line of the [federal] survey could be considered as a boundary separating the swamp and overflowed land from the sovereignty land."<sup>262</sup> The court found the following "circumstances" to be clearly established: that the true mean high-tide line could not be located because of the absence of a nearby primary tide station and because of the marshy character of the land;<sup>263</sup> that the defendant Trustees had produced no evidence<sup>264</sup> and had made no effort to locate the mean high-tide line boundary;<sup>265</sup> that the federal meander line could be located;<sup>266</sup> and that the acreage contained in the deed from the Trustees to Wetstone's predecessor in title compared favorably with the acreage contained within the meander line.<sup>267</sup> The court then held that "[u]nder the circumstances of this case, we hold the meander line constituted the boundary line between the swamp and overflowed lands and the sovereignty lands . . . ."<sup>268</sup>

Although the court limited its holding to the circumstances of the case, the *Wetstone* decision can be criticized on several grounds. First of all, the case law is overwhelming that meander lines were never intended to be boundaries<sup>269</sup> and, unless otherwise intended,<sup>270</sup> that conveyances of parcels which border on a meandered waterbody carry title to the ordinary high-water line, not to the meander line.<sup>271</sup>

261. *See id.*

262. 222 So. 2d at 12.

263. *Id.* at 11.

264. *Id.*

265. *Id.* at 14.

266. *Id.*

267. *Id.*

268. *Id.*

269. "It has been decided again and again that the meander line is not a boundary, but that the body of water whose margin is meandered is the true boundary." *Mitchell v. Smale*, 140 U.S. 406, 414 (1891); *accord*, *United States v. Lane*, 260 U.S. 662, 667 (1923); *Railroad Co. v. Schurmeir*, 74 U.S. (7 Wall.) 272, 287 (1868); *South Florida Farms Co. v. Goodno*, 94 So. 672, 675 (Fla. 1922); *Trustees of the Internal Improvement Fund v. Toffel*, 145 So. 2d 737, 742 (Fla. 2d Dist. Ct. App. 1962); *Lopez v. Smith*, 145 So. 2d 509, 515 (Fla. 2d Dist. Ct. App. 1962).

270. "[A] meander line may constitute a boundary where so intended or where the discrepancies between the meander line and the ordinary high water line leave an excess of unsurveyed land so great as to clearly and palpably indicate fraud or mistake." *Lopez v. Smith*, 145 So. 2d 509, 515 (Fla. 2d Dist. Ct. App. 1962).

271. *Mitchell v. Smale*, 140 U.S. 406, 414 (1891); *South Florida Farms Co. v. Goodno*, 94 So. 672, 675 (Fla. 1922). In reaching its decision to declare the meander line as the boundary line, the *Wetstone* court, 222 So. 2d at 12-13, relied on the following passage from the *Goodno* case, *supra*: "[W]here an official survey meanders not a permanent body of water, but low marsh or similar lands that are adjacent to other lands being surveyed, the meander line is the boundary." 94 So. at 675. The *Goodno* case involved a large

Secondly, even if the Trustees had intended to convey title of land up to the meander line to Wetstone's predecessor in title, they had no power to do so. The evidence showed that the meander line extended "several hundred feet, and even as far as a quarter of a mile, offshore in navigable waters along sectors of the border of the island."<sup>272</sup> Thus sovereignty land was included within the perimeter of the meander line. Since the Trustees did not hold title to, or have the power to convey, sovereignty lands before 1913 at the earliest,<sup>273</sup> the 1905 conveyance of swamp and overflow land to Wetstone's predecessor in title could not have included any sovereignty land.<sup>274</sup> Consequently, in those areas where the meander line ran over navigable water, the court's decision essentially conveyed to Wetstone land which the Board of Trustees itself could not have conveyed. Conversely, in those areas where the meander line ran inland of the mean high-water line, the court's decision effectively deprived Wetstone of swamp and overflow

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area of "impracticable sawgrass," traversed by the Caloosahatchee River. A meander line, significantly distant from the river, had been run through the middle of the sawgrass. The issue was whether a patent conveying "all of fractional section 28" carried title to land up to the river or up to the meander line.

In reaching its decision the *Goodno* court made a distinction between two different types of meander lines which are related to two different types of fractional sections. The first type of fractional section is that which is covered by a *permanent* body of water. The purpose of meander lines in this type of fractional section is to "approximately meander" the permanent body of water. In such cases "the water lines, and not the meander lines, may control as boundaries, even though there may be some land between the meander line and the water line." *Id.* The second type of fractional section is that which is not covered by a permanent body of water, but which, "at the time of the survey, [is] temporarily flooded, or is of such a nature that it cannot be readily surveyed. . . ." *Id.* The purpose of meander lines in this type of fractional section is to delineate that portion of the section which is capable of being surveyed. In this type of case "a conveyance of the 'fractional section' is, in general, controlled in its boundaries by the survey and meander lines." *Id.* The *Goodno* court found the meander line at issue to be of the second type—"not delineations of permanent bodies of water, but of an 'impracticable sawgrass marsh' . . ." *Id.* at 676. The court accordingly held the boundary to be the meander line.

The meander line at issue in *Wetstone* was most likely of the first type distinguished in *Goodno*; *i.e.*, an "approximate meander" of the permanent navigable water which surrounded Wetstone's island. Consequently, under *Goodno*, the conveyance of fractional sections to Wetstone's predecessor in title carried title to the mean high-water line, not to the meander line. *Goodno*, therefore, is not a precedent supporting the Florida Supreme Court's decision in *Wetstone* but, on the contrary, is precedent for a completely opposite result.

272. 222 So. 2d at 15 (Ervin, C.J., dissenting).

273. See notes 50 & 52 and accompanying text *supra*.

274. See *Pierce v. Warren*, 47 So. 2d 857, 859-60 (Fla. 1950), stating: "If the property [swamp and overflowed land] was in fact [sovereignty] land in 1911, there was no power in the trustees to convey it, and the deed attempting to do so was void." The *Pierce* court reached this conclusion because it found that the Trustees had no power to convey sovereignty land prior to a 1917 statute authorizing them to do so. *Id.*; see note 52 *supra*.

land to which he was legally entitled under the 1905 conveyance.<sup>275</sup>

A third possible criticism of *Wetstone* is based on state constitutional grounds. Since the conveyance in *Wetstone* involved swamp and overflow lands, the *Hughes-Borax* (mean high-tide line) boundary rule would not attach.<sup>276</sup> It is arguable, however, that article X, section 11, of the Florida constitution precludes a repetition<sup>277</sup> of the *Wetstone* decision. As previously noted, that section, incorporated into the 1968 constitution, provides that all sovereignty lands, "including beaches below mean high water lines," are held in trust for the people of the state. Thus, in any post-1968 *Wetstone*-type case, courts are probably<sup>278</sup> barred by the state constitution from declaring the meander line, or any line other than the mean high-water line, as the boundary between private upland and sovereignty land—regardless of how difficult location of the mean high-water line might be.

A final criticism of *Wetstone* can be made on policy grounds. *Wetstone* leaves the door open for riparian owners to bring quiet title actions, asserting their boundary to be the meander line, whenever the mean high-water line is difficult to locate. Riparian owners would most likely bring such actions when the meander line is significantly off shore, thus hoping to enlarge their property. Conversely, the state logically could bring similar quiet title actions in cases where the meander line runs predominantly landward of the shore. By such actions either

275. If a plat shows that land borders on a waterbody, but the meander line is landward of the shore of the waterbody, the boundary line is nevertheless the mean high-water line of the waterbody. *United States v. Lane*, 260 U.S. 662 (1923); *South Florida Farms Co. v. Goodno*, 94 So. 672 (Fla. 1922).

276. See notes 158-65 and accompanying text *supra*.

277. Since the *Wetstone* case itself arose before the 1968 constitution took effect, the mean high-water provision in art. X, § 11, was probably not applicable.

278. Article X, § 11, of the state constitution declares that sovereignty lands, "including beaches below mean high water lines," are held in trust for the people. (Emphasis added). It seems possible to construe this language to the effect that the mean high-water line is declared to be the boundary *only* on "beaches." Such an approach would raise the question of the definition of "beach." In § 370.01(15) of the Florida statutes (salt Water Fisheries and Conservation Act) "beaches" is defined as follows:

Beaches . . . shall mean the coastal and intracoastal shoreline of this state bordering upon the waters of the Atlantic ocean, the Gulf of Mexico, the straits of Florida, and any part thereof, and any other bodies of water under the jurisdiction of the State of Florida, between the mean high water line and as far seaward as may be necessary to effectively carry out the purposes of this act.

Thus, under this statute, "beaches" refers to the entire shoreline of any waterbody under state jurisdiction. If the word "beaches" in art. X, § 11, were given such a definition, the constitution would mandate the mean high-water line to be the boundary between all sovereignty land and private upland. This same result would obtain if art. X, § 11, were interpreted in light of the common law rule that the boundary of all sovereignty land is the mean high-water line regardless of character of the abutting upland. See *Miller v. Bay-To-Gulf, Inc.*, 193 So. 425, 427 (Fla. 1940).

the state or the riparian owner could deprive the other party of property. Furthermore, since meander lines are fixed lines, *Wetstone*, and any similar decisions in the future, would effectively abolish the doctrines of accretion, reliction, erosion and avulsion for the property in question. Thus, the state and the riparian owner would be precluded by the nonambulatory meander line boundary from gaining land under these doctrines. If, for example, massive erosion occurred, the private riparian owner would hold title to sovereignty lands; if massive accretion occurred, the private owner would no longer own riparian land.

Some of these dangers were recognized by Chief Justice Ervin in his dissent in *Wetstone*:

This precedent . . . permitting riparian proprietors on some such basis or pretext as their inability to currently locate by survey a line of mean high water . . . as a boundary . . . and, instead, use the old meander lines . . . to establish ownership to adjacent offshore submerged lands in navigable waters within such meanders, poses a very real threat to existing rights of people generally to enjoy navigable waters hitherto protected by the inalienable trust doctrine.

. . . .

If *Wetstone* and others similarly situated are ultimately successful in extending their titles over navigable waters to these old meanders, the Trustees will be helpless, in many areas, to prevent the submerged areas embraced within such meanders from being dredged and filled . . . .

It should be relatively easy under this precedent for many owners of upland properties so meandered to show [that] their frontages are bordered by marshes, mangroves, mud flats, and low flat areas, and that there is a lack of survey data [and] tidal gauging stations . . . and consequently [that] they are entitled to . . . [have] old meanders recognized as the water line boundaries of their properties instead of the line of mean high water.

It appears to me this case opens an unnecessary Pandora's box of problems for the people of the state not hitherto contemplated by our laws or decisions . . . .<sup>279</sup>

Although *Wetstone* may not have opened a "Pandora's box," there are several cases currently pending against the Board of Trustees wherein riparian owners are seeking to have meander lines declared their boundary.<sup>280</sup>

279. 222 So. 2d at 18-19.

280. Interview with Kenneth G. Oertel, General Counsel, State of Florida Board of Trustees of the Internal Improvement Trust Fund, in Tallahassee, October 23, 1973.

*b. Legislative Resolution.*—Since judicial responses of the *Wetstone* type may be unwise, inadequate or, under the mean high-water line provision of the 1968 Florida constitution, invalid,<sup>281</sup> ultimate resolution of the problem of boundary demarcation in difficult areas may lie with the legislature. Two legislative approaches to the boundary problem are possible: a direct approach, involving the promulgation of statutory boundary guidelines; and an indirect approach, involving the use of land and water management techniques.

The direct approach was attempted by the Florida Legislature in the Coastal Mapping Bill,<sup>282</sup> which was passed by both houses of the 1973 Legislature, but vetoed by the Governor.<sup>283</sup> The main thrust of the bill was to authorize the Department of Natural Resources "to conduct a comprehensive program of coastal boundary mapping with the object of providing accurate surveys of the coastline of the state. . . ."<sup>284</sup> It is clear that one of the primary purposes of the maps would be to depict the mean high-water line,<sup>285</sup> which is "recognized and declared to be" the boundary between private uplands and public sovereignty lands.<sup>286</sup> The mean high-water line would be located in accordance with NOS (hence *Borax*) methodology:<sup>287</sup> tidal datums would be computed by nineteen year observations<sup>288</sup> or by estimation techniques,<sup>289</sup> and the mean high-water line determined by leveling<sup>290</sup> or photogrammetry.<sup>291</sup> Where the mean high-water line is not ascertainable, as in areas of dense vegetation, the "apparent shoreline" would

281. See note 277 *supra*. The Trustees are currently involved in litigation which may test the validity of *Wetstone* under the 1968 Florida constitution. Interview with Kenneth G. Oertel, *supra* note 280.

282. Fla. H.R. 1368 (1973).

283. See notes 298-301 and accompanying text *infra*.

284. Fla. H.R. 1368, § 6 (1973).

285. Fla. H.R. 1368, § 2 (1973).

286. Fla. H.R. 1368, § 4(1) (1973). The following conveyances, if valid and if they conveyed title below the mean high-water line, are excepted from the recognized mean high-water line boundary: Spanish land grants before the Treaty Cession in 1821, conveyances by the United States before Florida achieved statehood, and conveyances by the State of Florida. Fla. H.R. 1368, §§ 4(1)(a)-(c) (1973).

287. See Fla. H.R. 1368, § 14 (1973).

288. Fla. H.R. 1368, § 14(2) (1973).

289. Fla. H.R. 1368, §§ 14(3), (5) (1973). The two estimation techniques provided for are comparison with simultaneous observations and mathematical interpolation. See notes 179 & 180 and accompanying text *supra*.

290. Fla. H.R. 1368, § 15 (1973). Leveling is "the determination of the elevations of points relative to some arbitrary or natural level surface called datum." Fla. H.R. 1368, § 3(11) (1973). Leveling has been referred to in this note as projecting a tidal datum plane toward the shore. See note 176 and accompanying text *supra*.

291. Fla. H.R. 1368, § 15 (1973). Photogrammetry is "the science of making precise measurements from photographs." Fla. H.R. 1368, § 3(22) (1973).

be mapped instead.<sup>292</sup> By specifically providing that the common law doctrines of accretion, reliction, erosion and avulsion would be unaffected,<sup>293</sup> the bill retained the concept of an ambulatory boundary. Finally, the bill gave coastal boundary maps evidentiary effect, by providing:

Approved coastal zone maps shall be admissible before any court, administrative agency, political subdivision, or other tribunal in this state and shall be admissible as any other evidence of the location of the mean high water or mean low water lines represented on such maps. However, the location of the mean high water or mean low water lines represented on such maps may be more precisely identified by the introduction of field surveys made in accordance with the [essentially NOS] standards and procedures set forth in [later sections] of this act.<sup>294</sup>

If the Coastal Mapping Bill had been enacted into law, some of the problems discussed in this note would have been resolved. Of greatest significance, the NOS-*Borax* mean high-tide line boundary would have been legislatively adopted, ambulatory boundaries would have been statutorily recognized, and maps or surveys made in accordance with NOS procedures would have been given express evidentiary effect. The problem of boundary demarcation in marshy, mangrove and heavily vegetated areas, however, would not have been resolved by the mapping procedure. In these areas the bill provided for the mapping of the apparent shoreline, which is "the intersection of the mean high-water line datum with the outer limits of vegetation."<sup>295</sup> Such a map of the apparent shoreline would be a navigational aid,<sup>296</sup> but would be imprecise as a boundary demarcation.<sup>297</sup>

Although agreeing with its intent and expressing hope for its eventual enactment, the Governor vetoed the Coastal Mapping Bill.<sup>298</sup> The Governor's veto was prompted by the provision giving evidentiary effect to the maps and the provision recognizing the mean high-water

292. See Fla. H.R. 1368, §§ 3(30), 10 (1973).

293. Fla. H.R. 1368, § 4(3) (1973).

294. Fla. H.R. 1368, § 10 (1973).

295. Fla. H.R. 1368, § 3(30) (1973).

296. One of the purposes of the maps is the "promotion of marine navigation." Fla. H.R. 1368, § 2 (1973).

297. The bill recognizes the imprecision of the apparent shoreline for boundary demarcation purposes, by providing: "Where the maps do not designate the mean high-water line but instead an apparent shoreline, the apparent shoreline so designated shall not be used as an indication of the mean high-water line." Fla. H.R. 1368, § 10 (1973).

298. Veto Letter from Reubin Askew, Governor of Florida, to Richard Stone, Secretary of State of Florida, July 3, 1973.

line as the upland/sovereignty land boundary. The Governor objected to the "automatic" introduction of the maps into evidence because the mapping procedure "has a certain inherent margin of error. . . . Thus such a map by itself could not be used to establish a line on the ground. . . . To accurately determine ownership of land, a field survey using proper tidal data is the most acceptable procedure."<sup>299</sup> The Governor's objection to this provision may be more one of evidentiary procedure than of substance; whereas the bill provides that the mean high-water line represented on the maps "may be more precisely identified by . . . field surveys,"<sup>300</sup> the Governor would seem to prefer the field surveys to be introduced into evidence in the first instance. Since the maps themselves would be based primarily on the field surveys, the Governor's suggested change should not be detrimental, and, in fact, may be more in accord with "best evidence" principles than was the bill itself.

The Governor's objection to the provision recognizing the mean high-water line boundary is more crucial. The objection to this provision was phrased as follows:

Section 4 pertaining to the legal significance of the mean high water and mean low water lines is questionable. This section has been disputed by capable lawyers. . . . Because the courts are continuing to interpret this area of the common law, it would be more appropriate to leave to them definitions of this kind.<sup>301</sup>

As has been discussed, common law courts have been struggling with the boundary question at least since the time of Lord Hale, more than three centuries ago. It is difficult enough to resolve the problem of boundary location once the boundary has been legally defined; having no settled legal definition *a fortiori* compounds the problem. Thus it would seem appropriate for the legislature to settle the definitional problem in Florida by adopting the *Borax* definition. By not adopting a definition, the legislature would unnecessarily leave to the courts such interrelated questions as whether, and when, the *Hughes-Borax* rule attaches,<sup>302</sup> whether the Florida constitution mandates an ambulatory *Borax* boundary,<sup>303</sup> and whether Florida's common law mean high-water standard is calculated according to NOS-*Borax* procedure or according to Lord Hale's neap tide rule.<sup>304</sup>

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299. *Id.*

300. Fla. H.R. 1368, § 10 (1973).

301. Veto Letter, *supra* note 298.

302. See notes 226-33 and accompanying text *supra*.

303. See note 242 and accompanying text *supra*.

304. See notes 166-68 and accompanying text *supra*.

The indirect legislative approach to the boundary problem—land and water management—would aim not at precise boundary demarcation, but at the underlying function of the upland/sovereignty land boundary, *i.e.*, to delineate the line beyond which the state's interest is affected. At this boundary, however, the interests of both the riparian owner and the state focus on the use that can be made of the water. In general, the riparian owner's interest is in improving or increasing the value or enjoyment of his land, while the state's interest is in protecting against uses that would interfere with navigation, fishing or bathing, or that would endanger the biological systems, ecological systems or natural resources of the state.<sup>305</sup> In order to protect these interests the state need not know the precise location of the upland/sovereignty land boundary; indeed the state need not even hold title to the water or to the submerged land. The state can regulate water use on the same police power rationale<sup>306</sup> that local governments, through zoning laws, regulate land use.

Comprehensive coastal management, wetlands protection and beach preservation laws—of varying technique and scope—have already been enacted in several states.<sup>307</sup> The federal Coastal Zone Management Act of 1972<sup>308</sup> encourages states in this direction by providing money grants for the development<sup>309</sup> and administration<sup>310</sup> of any state coastal management program that comports with federal guidelines.<sup>311</sup> Florida has

305. See FLA. STAT §§ 253.123(2)(d), 253.124(2)-(3), 403.021 (1971); FLA. STAT. § 380.021 (Supp. 1972).

306. See *Zabel v. Pinellas County Water & Navigation Control Authority*, 171 So. 2d 376 (Fla. 1965); *Gies v. Fischer*, 146 So. 2d 361 (Fla. 1962).

307. See E. BRADLEY & J. ARMSTRONG, A DESCRIPTION AND ANALYSIS OF COASTAL ZONE AND SHORELAND MANAGEMENT PROGRAMS IN THE UNITED STATES (Sea Grant Technical Report No. 20, 1972).

308. 16 U.S.C.A. §§ 1451-64 (Supp. 1973).

309. 16 U.S.C.A. § 1454 (Supp. 1973).

310. 16 U.S.C.A. § 1455 (Supp. 1973).

311. In order to qualify for federal money a state coastal management program must include:

(1) an identification of the boundaries of the coastal zone subject to the management program;

(2) a definition of what shall constitute permissible land and water uses within the coastal zone which have a direct and significant impact on the coastal waters;

(3) an inventory and designation of areas of particular concern within the coastal zone;

(4) an identification of the means by which the state proposes to exert control over the land and water uses referred to in paragraph (2) of this subsection, including a listing of relevant constitutional provisions, legislative enactments, regulations, and judicial decisions;

(5) broad guidelines on priority of uses in particular areas, including specifically those uses of lowest priority;

(6) a description of the organizational structure proposed to implement the



already taken a limited step in this direction by the enactment of the Environmental Land and Water Management Act of 1972.<sup>312</sup> This act provides that the administration commission, comprised of the Governor and Cabinet,<sup>313</sup> can designate certain areas of the state as "areas of critical state concern."<sup>314</sup> Once an area has been so designated, no development, including "[a]lteration of a shore or bank of a seacoast, river, stream, lake, pond, or canal, [or] any coastal construction as defined in § 166.021,"<sup>315</sup> can take place without a permit.<sup>316</sup> In addition, there were at least one Senate bill<sup>317</sup> and one House bill<sup>318</sup> introduced in the 1973 Florida Legislature aimed at wetlands protection and coastal management. Both define wetlands according to the presence of designated species of vegetation,<sup>319</sup> and both provide for the protection of wetlands by use of the "area of critical state concern" technique.<sup>320</sup> The House bill, however, is more comprehensive, and provides for a master plan of development regulation<sup>321</sup> in a broadly

management program, including the responsibilities and interrelationships of local, areawide, state, regional, and interstate agencies in the management process.

16 U.S.C.A. § 1454 (b) (Supp. 1973).

312. FLA. STAT. ch. 380 (Supp. 1972).

313. FLA. STAT. § 380.031 (1) (Supp. 1972).

314. FLA. STAT. § 380.05 (Supp. 1972). Only the following areas can be designated as areas of critical state concern:

(a) An area containing, or having a significant impact upon, environmental, historical, natural, or archaeological resources of regional or statewide importance.

(b) An area significantly affected by, or having a significant effect upon, an existing or proposed major public facility or other area of major public investment.

(c) A proposed area of major development potential, which may include a proposed site of a new community, designated in a state land development plan.

FLA. STAT. § 380.05(2) (Supp. 1972) (Note omitted).

315. FLA. STAT. § 380.04 (2) (c) (Supp. 1972).

316. See FLA. STAT. § 380.05 (13) (Supp. 1972).

317. Fla. S. 1288 (1973) (died in committee).

318. Fla. H.R. 2146 (1973) (passed in house, did not reach senate floor; prefiled by same number for 1974 session).

319. Both bills define coastal wetlands, for example, in exactly the same language:

(3) "Coastal Wetlands" means any land upon which occurs a natural community of one or more of the following species: red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans-nitida*), white mangrove (*Laguncularia racemosa*), black needlerush (*Juncus roemerianus*), cordgrass (*Spartina cynosuroides*, *Spartina patens*, *Spartina alterniflora*), annual glasswort (*Salicornia bigelovii*), perennial glasswort (*Salicornia virginica*), sea purslane (*Sesuvium maritimum*, *Sesuvium portulacastrum*), saltgrass (*Distichlis spicata*), hightide bush (*Iva frutescens*), or salt wort (*Batis maritima*).

Fla. S. 1288, § 3 (3) (1973); Fla. H.R. 2146, § 380.52 (3) (1973).

320. Fla. S. 1288, § 4 (1973); Fla. H.R. 2146, § 380.70 (2) (1973).

321. Fla. H.R. 2146, § 380.60 (1) (1973). The bill would divide the coastal zone into three areas: "preservation areas," which would be protected from all development; "conservation areas," which would be available for limited development; and "development areas," which would be available for intensive development, *Id.*; see note 322 *infra*.

defined coastal zone.<sup>322</sup>

It is not within the scope of this note to discuss land and water management plans. The point is that one of the main functions of the upland/sovereignty land boundary is to mark the line beyond which the riparian owner needs state permission to engage in development of his land. If all land and water, both navigable and nonnavigable, within a defined zone were subject to a comprehensive state development plan, then the riparian owner would need state permission to engage in development regardless of where the boundary line is located. Thus, much of the reason for litigating the precise location of the upland/sovereignty land boundary could come to an end.<sup>323</sup>

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322. The coastal zone is defined as follows:

(7) "Coastal zone" means the coastal waters including lands therein and thereunder, and adjacent shorelands including water therein and thereunder, which are strongly influenced by each other and are in proximity to the shoreline of the state. The coastal zone includes, but is not limited to, transitional and intertidal areas, territorial sea, all vegetated or once vegetated salt marshland or swampland, coastal wetlands and beaches. Excluded from the coastal zone are lands the use of which is by law subject solely to the discretion of or which is held in trust by the federal government, its officers or agents.

Fla. H.R. 2146, § 380.52 (7) (1973).

The coastal zone has already been defined and mapped by the Florida Coastal Coordinating Council. FLORIDA COASTAL COORDINATING COUNCIL, FLORIDA COASTAL ZONE MANAGEMENT ATLAS: A PRELIMINARY SURVEY AND ANALYSIS (Dec. 1972). The coastal zone was delineated by combining physical features with the "boundaries of selected census enumeration districts." Thus defined, Florida's coastal zone has an inland boundary varying from two to twenty-five miles from the coastline. *Id.* at *ii*. Every county in Florida is mapped into preservation, conservation and development areas. *See* note 321 *supra*.

323. If a regulatory coastal management or wetlands protection plan were implemented, boundary litigation would undoubtedly be replaced or supplemented by substantive due process attacks on the regulations. *See* *Candlestick Properties, Inc. v. San Francisco Bay Conservation and Dev. Comm'n*, 89 Cal. Rptr. 897 (Ct. App. 1970); *Bartlett v. Zoning Comm'n*, 282 A.2d 907 (Conn. 1971); *Golden v. Board of Selectmen*, 265 N.E.2d 573 (Mass. 1970); *MacGibbon v. Board of Appeals*, 255 N.E.2d 347 (Mass. 1970); *Commissioner of Natural Resources v. S. Volpe & Co.*, 206 N.E.2d 666 (Mass. 1965). *See generally* *Sax, Takings and the Police Power*, 74 Yale L.J. 36 (1964).