

CHAPTER 6

The Tidal Boundary Problem

The last of the three questions on which the Supreme Court sought recommendations from the Special Master in the *California* case dealt with tidal boundaries. This was because the Court used the term "ordinary low water mark" to define the federal-state boundary.¹ The specific question submitted to the Master was: "By what criteria is the ordinary low water mark on the coast of California to be ascertained?" (See 2111.) The word "ordinary" lacks the technical precision that is essential in the establishment of tidal boundaries and raises problems of interpretation that require an analysis of tidal phenomena insofar as they pertain to the characteristics of the tide encountered along the coasts of the United States. With respect to the case before the Special Master, it involved a consideration of the type of tide that exists along the California coast and a development of criteria by which the boundary line could be demarcated on the ground.²

61. OPPOSING VIEWS OF THE PROBLEM

In the interpretation of the term "ordinary low water mark," as applied to the California coast, cognizance must be taken of the fact that the tide there is of the mixed type with two low waters of unequal height occurring on most tidal days. The problem was, therefore, which of the lows would be more responsive to the term "ordinary low water mark"—the higher low, the lower low, or the mean of the two. The boundary line would be farther inshore or farther offshore, depending upon which is used.³ (See fig. 17.)

1. In its decree of Oct. 27, 1947, the Supreme Court said that the United States has paramount rights in the submerged lands seaward of the "ordinary low water mark." *United States v. California*, 332 U.S. 804 (1947). The same terminology was used by the Court in *United States v. Louisiana*, 339 U.S. 699 (1950), and in *United States v. Texas*, 339 U.S. 707 (1950).

2. Had the Court used the word "mean" instead of "ordinary," no problem of interpretation would have arisen because "mean" is a technical term with definite significance in tidal terminology. SCHUREMAN, TIDE AND CURRENT GLOSSARY 23, SPECIAL PUBLICATION No. 228, U.S. COAST AND GEODETIC SURVEY (1949).

3. From a practical point of view, this question was not too important, at least insofar as the coast of California was concerned, for with the exception of Crescent City Bay, the effect on the boundary line would not be too great. But a principle of law was to be established for the guidance of engineers in marking the boundary, and the Coast Survey was to assist in establishing that principle.

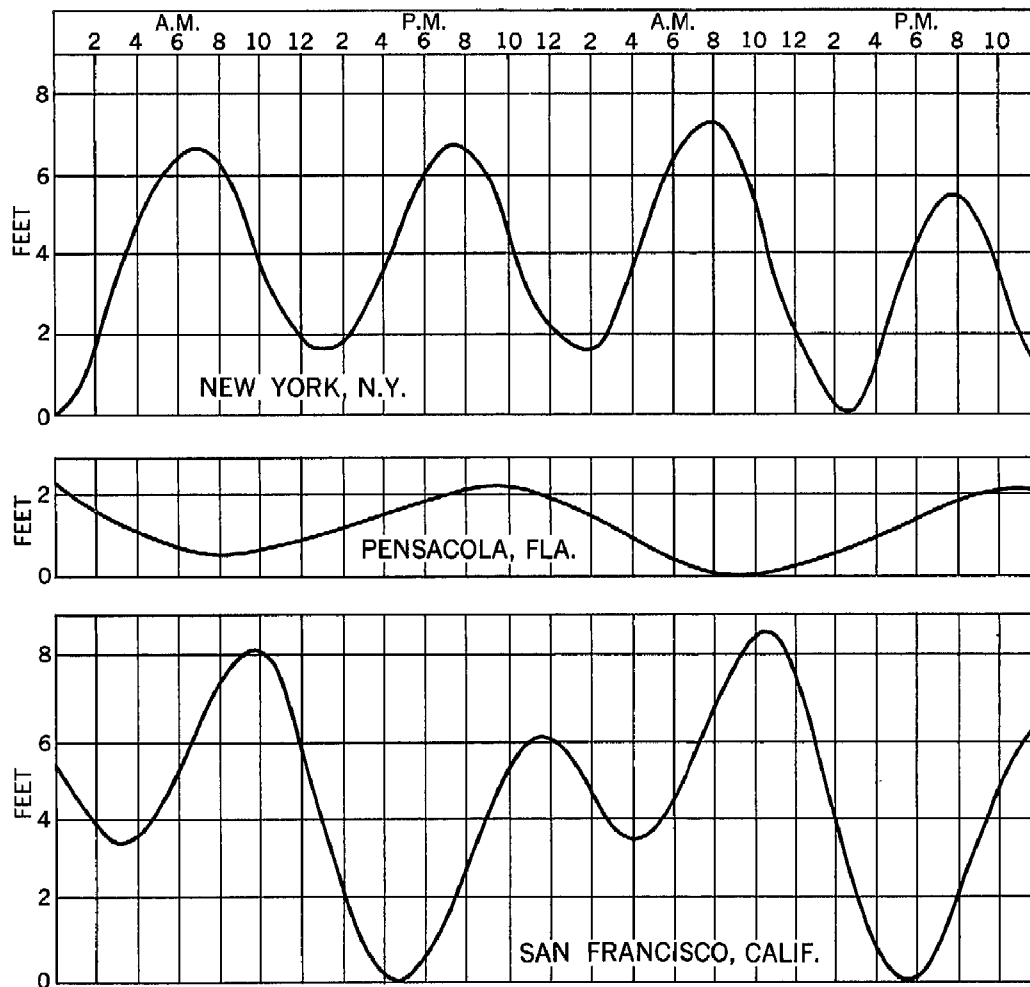


FIGURE 17.—Types of tide along the coasts of the United States. From observed tides of Jan. 15-16, 1961.

In the Government's view, both the low waters, averaged over the cyclical period of 18.6 years, should be used in arriving at the datum of ordinary low water from which the ordinary low-water mark could be ascertained (*see* 64). It rested its case upon the interpretation placed on the word "ordinary" by the Coast and Geodetic Survey, and upon the persuasive aid afforded by the Supreme Court in defining the cognate term "ordinary high-water mark" in *Borax Consolidated, Ltd. v. Los Angeles*, 296 U.S. 10 (1935) (*see* 6413).⁴

4. Brief for the United States before the Special Master, 151-161 (May 1952), *United States v. California*, Sup. Ct., No. 6, Original, Oct. Term, 1951.

It was California's position that only the lower of the two low waters each day, averaged over the requisite period of time, should be used. This contention was predicated upon the fact that there was no rule in international law that required ordinary low-water mark to be interpreted as meaning the average of all tides, and that convenience and uniformity would both be served by adopting the same datum for the federal-state boundary as used for other purposes. It cited the use by the Coast and Geodetic Survey of the mean of the lower low waters as the datum for its hydrographic surveys and nautical charts on the Pacific coast (*see* 631), and the Corps of Engineers' use of the same datum in its work there.⁵ And as in the case of the overall unit area, it also contended that adoption of the lower plane would better serve the national interest by placing the international domain as far seaward as possible (*see* 54).⁶

62. ASPECTS OF THE TIDE

To better understand the applicability or inapplicability of these diverse viewpoints, certain aspects of tidal phenomena will be clarified, particularly those that may be determinative in the selection of one datum over another. Emphasis will be placed on the specific problem that faced the Special Master in the *California* case, both from the standpoint of the arguments advanced by the contending parties and from the point of view of the legal criteria developed for the determination of the term ordinary high-water mark.

The phenomenon of the tide is far from being a simple one. The tidal effect of sun and moon upon the waters of the earth depends upon the relative positions of the three bodies at a particular time and a particular place. Considering then that the earth revolves on its axis once every 24 hours, and its journey around the sun takes 1 year; that the moon revolves around the earth once every 29½ days, and its orbit is inclined on the average 23½° to the earth's equator; that every body of water has its own period of oscillation, and responds differently to the tide-producing forces; and that all of these factors, together with the configuration of the land bordering the water areas, enter into the formation of the tide, there is present an almost limitless number of possible combinations into which these factors can unite to produce both differences at the same time

5. Sec. 5 of the River and Harbor Act of Mar. 4, 1915, 38 Stat. 1053, requires the use of the datum of mean lower low water for referencing channel depths in tidal waters tributary to the Pacific Ocean.

6. Brief for the State of California in the Proceedings before the Special Master, 140-143 (June 6, 1952), *United States v. California*, Sup. Ct., No. 6, Original, Oct. Term, 1951.

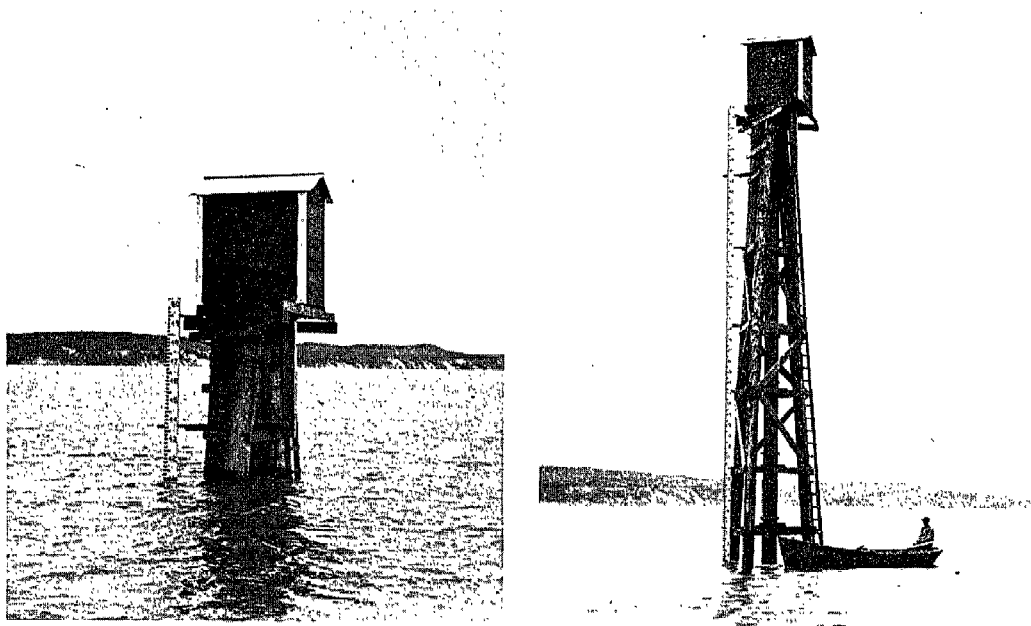


FIGURE 18.—High and low water at Anchorage, Alaska. The illustration shows a range of 34 feet, as compared with 2 feet at Pensacola, Fla. (*see* fig. 17).

at different places and differences at the same place at different times (*see* fig. 18).⁷

621. DIURNAL INEQUALITY

Along the Pacific coast of the United States, the mixed type of tide is the predominant one—two high and two low waters occur each tidal day, with marked differences between the morning and afternoon tides. This difference is called *diurnal inequality* and varies with the changing declination of the moon during a lunar month.⁸ In general, the inequality tends to increase with an increasing declination, either north or south, and to diminish as the moon approaches the equator.

7. SCHUREMAN, MANUAL OF HARMONIC ANALYSIS AND PREDICTION OF TIDES 1-9, SPECIAL PUBLICATION No. 98, U.S. COAST AND GEODETIC SURVEY (1940).

8. For any particular day, the difference between the heights of the two high waters or the two low waters would be the measure of the respective inequalities. But the mean diurnal inequality (high water or low water) is one-half the average difference between the two high waters or the two low waters of each day over a 19-year period. To obtain the mean diurnal high-water inequality the mean of all high waters is subtracted from the mean of the higher high waters. Likewise, to obtain the mean diurnal low-water inequality the mean of the lower low waters is subtracted from the mean of all low waters. SCHUREMAN, *op. cit. supra* note 2, at 11.

The existence of diurnal inequality is an important factor in the determinations of the various vertical datums based on tidal definition, and makes necessary the distinction between the two high waters and between the two low waters of a day. Thus, of the former the higher is called the "higher high water" and the lower the "lower high water." Similarly, of the two low waters, the lower is called "lower low water" and the higher the "higher low water."

622. SPRING AND NEAP TIDES

Another variation in the rise and fall of the tide is related to the different phases through which the moon passes during a lunar, or synodic, month of approximately $29\frac{1}{2}$ days. At new moon the sun and moon are in line and on the same side of the earth. The tidal forces are then in the same phase and work in conjunction to strengthen each other and bring about the large tides which have been designated "spring tides." At such times high water rises higher and low water falls lower than at other times. At the end of $7\frac{1}{2}$ days the moon has passed through one-quarter of its journey and has reached quadrature. The tidal forces of sun and moon then act at right angles on the waters of the earth and are in opposition to each other, or in opposite phase. Each

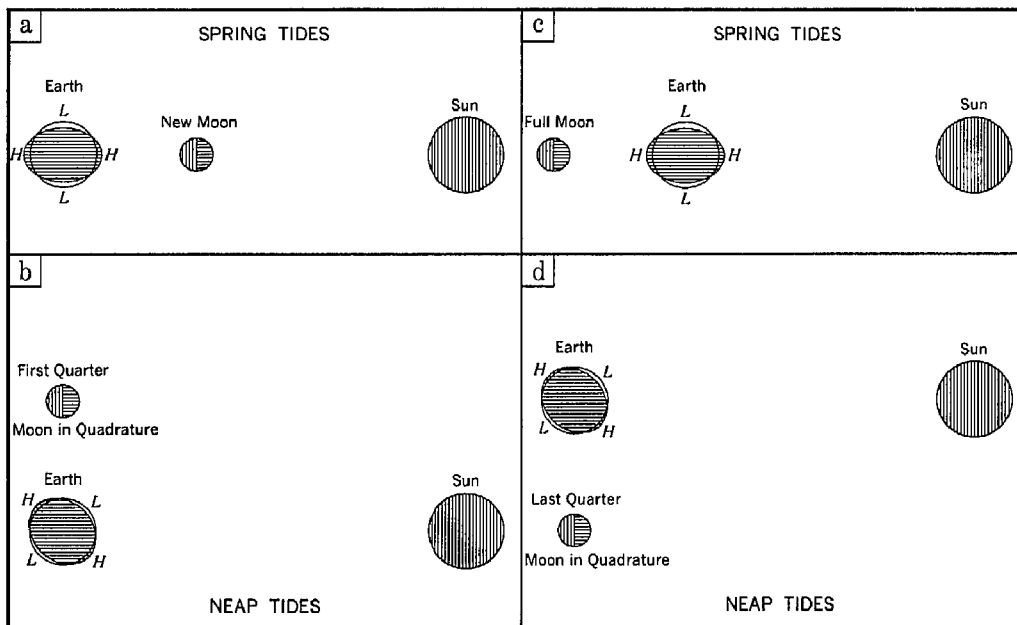


FIGURE 19.—Spring and neap tides during a lunar month.

force tends to minimize the force of the other body. The tide therefore does not rise as high nor fall as low as on the average. Because of their small range they have been designated as "neap tides." (See fig. 19.)⁹

After another $7\frac{1}{2}$ days, the sun and moon are again in line but on opposite sides of the earth. The moon is then in its "full" phase and the tidal forces act the same as during new moon and spring tides again occur. At the end of another period of $7\frac{1}{2}$ days, the moon has arrived at the third quarter of its course and is again in quadrature. The tidal forces again act in opposition as in the first quarter and neap tides result. At the end of a further period of $7\frac{1}{2}$ days, the sun and moon are again in line and on the same side of the earth and another cycle begins.¹⁰

63. TIDAL DATUMS

Reference datums that have their origin in the rise and fall of the tides are the most satisfactory of all datums because they possess the advantages of simplicity of definition, accuracy of determination, and certainty of recovery. It is for these reasons that they are used in hydrographic surveying and nautical chart work, and in the demarcation of waterfront boundaries.

There is no one natural or basic tidal datum, although the datum of mean sea level is frequently so designated because it is the plane about which the tide oscillates. There are a number of datums which may be derived from tidal observations, the selection of the most satisfactory one being dependent upon the specialized purpose which the datum is to serve and the type of tide existing in a given locality.¹¹

9. The origin of the terms "spring" and "neap" tides is stated by Wheeler to be "probably due to the fact that as the moon leaves the meridian of the sun in her orbital transit around the earth and approaches the quarters the tides begin to 'fall off,' or are 'nipped,' and neap tides ensue. As she leaves the quarters for the meridian they begin to 'lift,' or 'come on,' or 'spring up,' and when the meridian is reached spring tides ensue." WHEELER, A PRACTICAL MANUAL OF TIDES AND WAVES 49 (1906). Spring tides are also referred to as those occurring at the "full and change" of the moon. *Id.* at 36.

10. At most places spring and neap tides do not correspond exactly to the phases of the moon, but occur a day or two later; that is, spring tides do not occur exactly on the days of full and new moon, and neap tides do not occur exactly at the time of the moon's first and third quarters. This lag is known as the "phase age" and has different values in different localities. In New York Harbor, the phase age is 26 hours, while in Boston Harbor it is 38 hours. MARMER, TIDAL DATUM PLANES 5, SPECIAL PUBLICATION No. 135, U.S. COAST AND GEODETIC SURVEY (1951).

11. In its work along the coasts of the United States and in the interior of the country, the Coast and Geodetic Survey utilizes the following principal tidal datums: mean sea level, mean high water, mean low water, and mean lower low water. In addition, it recognizes the tidal datums of mean higher high water, and half tide level, or mean tide level, as of value to the engineer and for which the relationship to the other datums is determined. Information on the highest and lowest observed water levels is also usually available. Such levels are the result of tide and surge, and, strictly speaking, are not highest or lowest tides. They therefore cannot be classed in the category of tidal datums.

Along all coasts, the datum of "mean sea level" is used for referencing elevations of bench marks in the network of precise levels established by the Coast Survey throughout the United States and Alaska, it being the most practicable and the most stable datum for general engineering use. Similarly, along all coasts, the datum of "mean high water" is used as the plane of reference for the shoreline—the dividing line between land and sea—and for elevations of alongshore features on the topographic surveys and the nautical charts of the Bureau.

63I. HYDROGRAPHIC (CHART) DATUMS

For hydrographic surveying and for nautical chart work, a low-water datum, as a reference plane for soundings (water depths), is the most satisfactory because for the navigator the critical part of the tidal cycle is at the time of low water when depths are at a minimum. The controlling depth in a channel or over a shoal at this stage of the tide becomes important to the navigator, particularly where the controlling depth approaches the draft of his vessel. Any datum higher than low water would result in greater charted depths and might lead the navigator into a false sense of security. Another practical advantage of the use of a low-water datum is that corrections for the height of the tide, which the navigator obtains from the *Tide Tables* and which he must apply to the charted depth in order to find the depth of water for any given place and for any height of tide, will be predominantly additive; errors will be less likely to be introduced, since, as a general rule, it is a simpler matter to add a correction to a depth than to subtract it.¹²

But even low-water datums differ and the choice depends upon the type of tide that prevails in an area. Thus, on the Atlantic coast, where there are two tides a day of approximately equal range, successive low waters differ but slightly and the adopted chart datum is "mean low water," which is the average height of all the low waters over a 19-year period. On the Pacific coast and in Alaska, however, where the tide is of the "mixed" type, with two low waters in each tidal day but with marked variation in height between successive low waters, the chart datum of "mean lower low water" (the average of the lower low waters of each tidal day over a period of 19 years) is used.¹³

12. It is the practice in the Coast Survey to use the same datum in the *Tide Tables* for tidal predictions as is used for the nautical charts.

* 13. To use a higher datum along these coasts, such as "mean low water," would not serve the interests of the navigator. It is for this reason, and this alone, that the datum of mean lower low water was adopted by the Bureau for its hydrographic surveys and nautical charts along the Pacific coast and for Alaska. The advantages of using a mean lower-low-water datum over a mean low-water datum for Pacific coast charts are similar to those described above for low-water datums.

But the important point to keep in mind, insofar as chart datums are concerned, is that the topography of the sea bottom remains the same no matter what datum is used, and it cannot be said that the use of one datum instead of another results in greater accuracy in the charted depths.¹⁴ The selection is dictated solely by the practical needs of navigation.

The term mean low water is therefore one of technical definition and is not necessarily related to the chart datum. It is the same wherever two high waters and two low waters occur each tidal day, and is derived by averaging all the low waters over a considerable period of time, a 19-year average giving the best determination.

64. DEMARCATION OF TIDAL BOUNDARIES

Boundaries determined by the course of the tides involve two engineering aspects: a vertical one, predicated on the height reached by the tide during its vertical rise and fall, and constituting a tidal plane or datum, such as mean high water, mean low water, etc.; and a horizontal one, related to the line where the tidal plane intersects the shore to form the tidal boundary desired, for example, mean high-water mark, mean low-water mark.¹⁵ (See fig. 20.) The first is derived from tidal observations alone, and, once derived (on the basis of long-term observations), is for all practical purposes a permanent one.¹⁶ The second is dependent on the first, but is also affected by the natural processes of erosion and accretion, and the artificial changes made by man. A water boundary determined by tidal definition is thus not a fixed, visible mark on the

14. This does not take into account the increased accuracy that naturally results from the use of a greater number of observations for the determination of a datum plane. For example, twice as many tidal observations are used in the determination of mean low water than for the determination of mean high water. This would be of importance, under certain shoreline conditions, in determining a tidal boundary, but not for hydrographic or chart work.

15. In California, as in almost all states, the boundary of upland bordering the sea is the ordinary high-water mark. In a few states, however, the general rule has been modified and the ownership of upland extends to low-water mark.

16. A period of 19 years is generally reckoned as constituting a full tidal cycle because the more important of the periodic tidal variations due to astronomic causes will have gone through complete cycles, and because the variations of a nonperiodic character resulting from meteorological causes may be assumed to balance out during this epoch. Averages obtained from two overlapping 19-year epochs, for example 1924-1942 and 1925-1943, exhibit an inconsequential difference; however, those obtained from two independent 19-year epochs, for example 1903-1921 and 1930-1948, may show a difference great enough to be of significance where precise determinations are required. For New York, sea level from the 1930-1948 series is 0.29 foot higher than from the 1893-1911 series; at Baltimore, the 1930-1948 series gives a value 0.26 foot higher than the 1903-1921 series; and at Galveston, the 1930-1948 series shows a value 0.39 foot higher than the 1909-1927 series. Hence, in referring to a particular datum it should be specified which 19-year series is used. MARMER (1951), *op. cit. supra* note 10, at 63-64, 104-105.

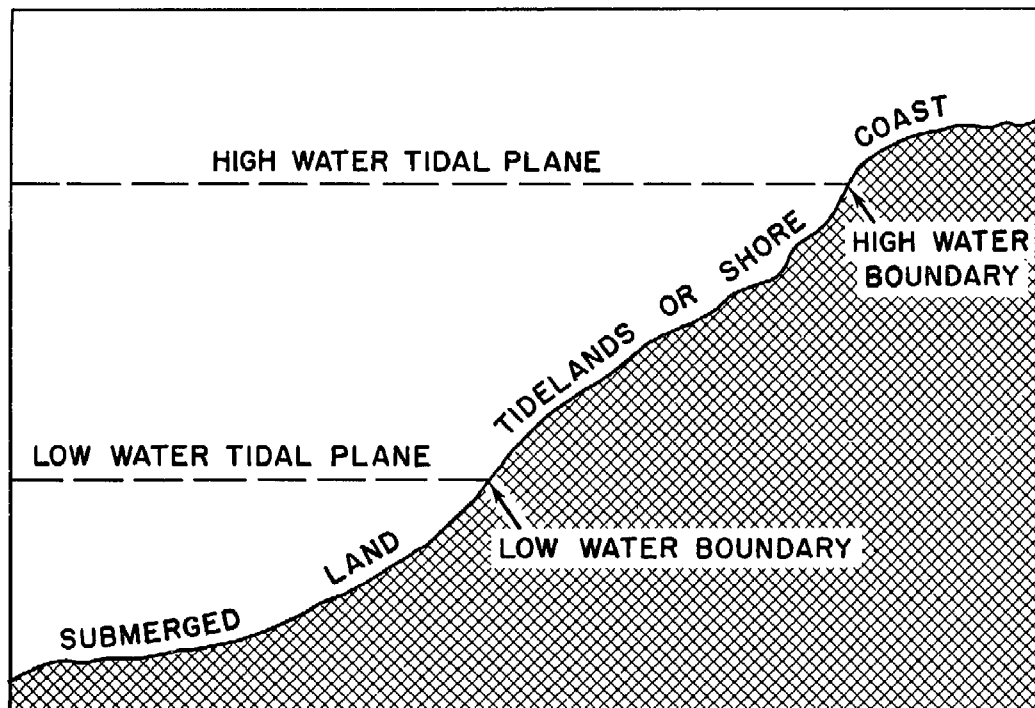


FIGURE 20.—The intersection of the tidal plane with the shore defines the tidal boundary.

ground, such as a roadway or fence, but represents a condition at the water's edge during a particular instant of the tidal cycle.¹⁷

641. ORDINARY HIGH-WATER MARK

In legal terminology, the term "ordinary high-water mark" is associated with the physical concept of "shore," and is traceable to the English common law. From the time of Lord Hale (1609–1676), it has been considered as settled law in England that the title and the dominion of the sea, and of the rivers and arms of the sea, where the tide ebbs and flows, and of all lands below high-water mark, are in the King. Such waters, and the lands which they cover,

17. In *Borax Consolidated, Ltd. v. Los Angeles*, 296 U.S. 10, 22 (1935), the Supreme Court notes this as the distinction between the upper limit of the shore at common law and under the civil law where, it says, "the shore extends as far as the highest waves reach in winter." In *Luttes v. State*, 324 S.W. 2d 167 (1958), the Supreme Court of Texas, in a comprehensive opinion, clarified the Spanish Law (the civil law) concept of seashore and held such interpreted references of *Las Siete Partidas* (the body of Spanish law written in the 13th century) as "covered with the water of the latter [the sea] at high tide, during the whole year, whether in winter or in summer," "their highest annual swells," "that part of the land covered by the highest swells in perennial agitation, during the winter as well as during the strong but customary summer storms," to be, in the light of modern conditions and the need for exact application, the line of mean higher high tide as determined from a 19-year period. *Id.* at 177, 181, 191.

either at all times, or at least when the tide is in, are incapable of ordinary and private occupation, cultivation, and improvement. Hence the title, or *jus privatum*, in such lands, belonged to the King as the sovereign, but was held by him as the representative of the people and was subject to the public right, or *jus publicum*, of navigation and fishing.¹⁸ This includes the "shore," which according to the English courts is confined to the "flux and reflux of the sea at ordinary tides."¹⁹ But what these tides were was left unsettled (*see* note 25 *infra*).

According to Lord Chief Justice Hale, one of the foremost jurists of 17th century England, there are three kinds of shores, that might be considered property of the King, depending on the kind of tides being considered:

(1st.) The high spring tides, which are the fluxes of the sea at those tides that happen at the two equinoxials.

(2d.) The spring tides which happen twice every month at full and change of the moon.

(3d.) Ordinary tides or neap tides, which happen between the full and change of the moon.²⁰

Of the first, Lord Hale says the shore encompassed by such tides does not belong to the King because such spring tides may overflow meadows and salt marshes which are the subjects of private ownership. Of the second, he says the lands covered by such fluxes are for the most part dry and maniorable which the other tides do not cover and should not belong to the Crown. He therefore concludes that the third type of tides, the neap tides, is what defines the shore.

This statement of Lord Hale is said to be the origin for the view that "neap tides" should be taken as the ordinary tides.²¹ But 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.²²

18. In *Shively v. Bowlby*, 152 U.S. 1 (1894), the Supreme Court exhaustively reviewed the law regarding public and private ownership of the shore, particularly in the Thirteen Original States.

19. *Blundell v. Catterall*, 5 B. & ALD. 268, 292 (1821). This case was cited by the Court in *Attorney-General v. Chambers*, *infra* note 23, at 213, for the holding that under the common law of England the upper limit of the shore is that reached by the "highest ordinary tides" (emphasis added) of the sea. This is evidently an error and "ordinary tides" must have been intended which would be in keeping with the subsequent discussion and final holding of the Court (*see* discussion *infra*).

20. HALE, *DE JURE MARIS* (By the Law of the Sea), Cap. VI; 1 Hargrave's Tracts 25 (1787).

21. *Borax Consolidated, Ltd. v. Los Angeles*, *supra* note 17, at 23.

22. R. G. Hall, in his "Essay on the Rights of the Crown and the Privileges of the Subject in the Sea-Shores of the Realm" (1830) (sometimes referred to as "Hall on the Seashore"), has accepted the first interpretation, for he amplifies Lord Hale's designation of "neap tides" as those which happen "twice in the twenty-four hours." These, he says, "take place daily, and more regularly" than the spring tides. *Id.* at 12. The second interpretation was accepted by the Court in *Attorney-General v. Chambers* (*see* note 23 *infra*).

6411. *At Common Law—Attorney-General v. Chambers*

The subject matter was thoroughly considered by the English courts in *Attorney-General v. Chambers*.²³ The Court stated that all authorities are in agreement that the Crown's right to the *littus maris* (the seashore) is confined to what is covered by "ordinary" tides. So the question for determination was, What is the meaning of the word "ordinary"? In the absence of specific authority,²⁴ the Court looked to the principle of the rule, as laid down by Lord Hale, which gives the shore to the Crown; that is, such land is not capable of ordinary cultivation or occupation and is in the nature of unappropriated soil, in contradistinction to the soil to the landward of the "shore," which is for the most part dry and maniorable.

But in applying that principle, the Court, interpreting Lord Hale's neap tides to mean only those which occur twice a month, reached the conclusion that the same reason that excludes the spring tides only from consideration should also exclude the neap tides because both tides "happen as often as each other." (See 622.) It therefore held the landward limit of the seashore to be "the line of the medium high tide between the springs and the neaps," that is, as defined by the medium tides of each quarter of the tidal period. This it believed afforded a good criterion because these tides more frequently reach and cover the shore than they leave it uncovered. For, it said: "For about three days it is exceeded, and for about three days it is left short, and on one day it is reached. This point of the shore therefore is about four days in every week, i.e., for the most part of the year, reached and covered by the tides."²⁵

6412. *In American State Courts—Teschemacher v. Thompson*

Tidal boundaries are not new in American jurisprudence. The early grants, charters, and conveyances, which constitute the first links in the chains

23. 4 De G. M. & G. 206 (1854). This case involved the extent of ownership of a district abutting the seashore. It was charged that the seashore, which was vested in the Crown, "extended landwards as far as high-water mark at ordinary monthly spring-tides, or at all events far beyond high-water mark at neap tides, and up to the medium line of high-water mark between neap and spring tides."

24. The nearest approach to a determination of this question was the case of *Lowe v. Govett*, 3 B. & AD. 863 (1832), where certain recesses of the coast, covered by the high water of ordinary spring tides, but not by the medium tides between spring and neap tides, were held to be above ordinary high-water mark, showing that the Court considered "ordinary high-water mark" not as high as the limit of "high water at ordinary spring tides."

25. *Attorney-General v. Chambers*, *supra* note 23, at 214, 217. The Court, therefore, defined the "ordinary tides" of *Blundell v. Catterall*, *supra* note 19, as the medium high tides between the springs and the neaps. If spring tides alone were used, a strip of shore to seaward of the spring limit would be covered only twice during the month; the rest of the month it would be uncovered. Conversely, if neap tides alone were used, a strip of shore to landward of the neap limit would be uncovered only twice during the month; the rest of the month it would be covered. Neither one would therefore express any concept of being covered by ordinary tides.

of title on which present ownerships of lands along our seacoasts are based, contain expressions such as "high-water line," "high-water mark," "the line of ordinary high water," and similar expressions pertaining to low water. Such references are at best indefinite and reflect an oversimplification of a phenomenon inherently complex and variable (*see* 62). The result is that decisions interpreting such generalized expressions sometimes contain imperfections which suggest that appropriate scientific data were not always made available to the court. *Teschmacher v. Thompson*²⁶ is a case in point. The highest court of the State of California interpreted "ordinary high-water mark" as follows:

The limit of the *monthly spring tides* is, in one sense, the usual high water mark; for, as often as those tides occur, to that limit the flow extends. But it is not the limit to which we refer when we speak of "usual" or "ordinary" high water mark. By that designation we mean the limit reached by the *neap tides*; that is, those tides which happen between the full and change of the moon, *twice in every twenty-four hours*.²⁷ (Emphasis added.)

This language is unclear and it is impossible to state with certainty what the court had in mind. It is scientifically inaccurate in its reference to spring and neap tides. The court refers to "monthly spring tides," when spring tides occur twice a month at the full and change of the moon; and it uses the word "neap," not in its accepted technical sense as those tides which occur twice a month when the moon is in its first and third quarters, but in some ambiguous sense to designate a plurality of tides between full and change. (*See* 622.) The court apparently thought, as Hall did, that all tides are either spring or neap; that the springs occur but once a month; and that all other tides are neap tides and differ but little among themselves, making them the "usual" or "ordinary" tides. The most that can be said for the decision is that the court was giving its own definition of neap tides as including all the tides that occur between the full and change of the moon, excepting the spring tides.²⁸ Even greater confusion results from the later case of *Otey v. Carmel Sanitary Dist.*, 26 P. 2d 308 (1933), in which the Supreme Court of California defined "ordinary high-water mark" as "the limit reached by the neap or twice-a-day tides."

26. 18 Cal. 11 (1861), 79 Am. Dec. 151.

27. *Id.* at 21. This is a carry-over of Lord Hale's ambiguous reference to "neap tides" and Hall's interpretation of that ambiguity (*see* note 22 *supra* and accompanying text). Both authorities are cited by the court. Although the court's definition of "ordinary high-water mark" was dictum, the decision having been expressly placed on other grounds, the rule has been followed in other California cases. *See*, for example, *Forgeus v. Santa Cruz County et al.*, 140 Pac. 1092 (1914), where the *Teschmacher* definition is cited as the prevailing rule in California.

28. Although the language is confusing, there is an indication here that the court would use both the lower high and the higher high water in determining "ordinary high water." On the matter of the court's definition of neap tides, it should be noted that under the American system of dual sovereignty, it is within the competence of each state to establish its own laws relative to tidal boundaries, and the decisions of its highest court are part of that law, but to designate all the tides between the full and change as "neap" cannot be reconciled scientifically and is contrary to long-established tidal terminology (*see* 622).

Another shortcoming of the early state decisions, which was also true of the English decisions, was the generality of the language used in defining tidal boundaries, whether the reference was to high-water mark or to low-water mark. This is traceable to two causes: (1) When waterfront property was cheap, there was no need for precision in locating the boundary between the shore and the upland; and (2) tidal knowledge, particularly as it pertained to the effect of periodic astronomic variations on datum-plane determinations, had not yet been fully developed (*see note 16 supra*).

6413. *In Federal Courts—Borax Consolidated v. Los Angeles*

Borax Consolidated, Ltd. v. Los Angeles (*see note 17 supra*), was a landmark case in the law of tidal boundaries. It established for the Federal courts not only the rule that is to be applied in the interpretation of the term "ordinary high-water mark" when construing a federal grant, but it also established the first precise standard for the demarcation of such boundary on the ground.

The case was important to the Coast Survey because it dealt almost exclusively with the subject of tides, and both appellate courts (the Circuit Court of Appeals and the Supreme Court of the United States) referred extensively to Coast Survey Special Publication No. 135, Tidal Datum Planes. It was the first time that the High Court took judicial notice of the Bureau's definition of mean high water.²⁹

The specific question raised in the Supreme Court, relating to tidal boundaries, was the ruling of the Court of Appeals in instructing the lower court to recognize as the boundary between tidelands and upland "the mean high-tide line," thus rejecting the line of "neap tides" as contended for by the Borax company.

In discussing this instruction, the Court said that "by the common law, the shore is confined to the flux and reflux of the sea at ordinary tides"; that is, "the land between ordinary high and low-water mark, the land over which the daily tides ebb and flow. When, therefore, the sea, or a bay, is named as

29. Involved was the boundary between upland (land above high water) on Mormon Island in the inner harbor of San Pedro, held by the Borax company under a patent from the United States, and adjacent tidelands belonging to the City of Los Angeles under a grant from the State of California. The suit was instituted in a Federal district court by the city as a suit to quiet title to lands it was claiming as tidelands, under the Acts of 1911 and 1917 which granted it the tidelands and submerged lands situated below the line of mean high tide of the Pacific Ocean. It was dismissed on the ground that the limits of the federal grant could not be inquired into collaterally. *City of Los Angeles v. Borax Consolidated, Ltd.*, 5 F. Supp. 281 (1934). On appeal to the Circuit Court of Appeals, it was held that the question as to the location of the ordinary high-water mark, marking the boundary between the properties, was one for judicial determination. It therefore defined the meaning of "ordinary high-water mark," and remanded the case to the district court for retrial in accordance with this definition. *City of Los Angeles v. Borax Consolidated, Ltd.*, 74 F. 2d 901 (1935). An appeal was taken to the Supreme Court of the United States.

a boundary, the line of ordinary high-water mark is always intended where the common law prevails.”³⁰

In considering the question as to how the line of ordinary high water is to be determined, the Court adverted to Lord Hale’s classification of shores (see 641), and to the ruling of the English court in *Attorney-General v. Chambers* (see note 23 *supra*) that the medium tide line must be treated as bounding the title of the Crown.³¹ As to the use of neap high tides for determining ordinary high water, as contended for by the Borax company on the basis that the California court had so defined it in *Teschemacher v. Thompson* (see note 26 *supra*), and other cases (see 6412), the Court said that while “the construction of the state statute . . . is a question for the state courts,” in determining the limit of a federal grant there was “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. In order to include the land that is thus covered, it is necessary to take the mean high tide line which, as the Court of Appeals said, *is neither the spring tide nor the neap tide, but a mean of all the high tides.*”³² (Emphasis added.)

In upholding the instruction of the Circuit Court of Appeals, the Supreme Court defined more specifically how the mean of all the high tides was to be ascertained in order to achieve the requisite accuracy for delimiting the mean high-tide line. It said:

In view of the definition of the mean high tide, as given by the United States Coast and Geodetic Survey, that “Mean high water at any place is the average height of all the high waters at that place over a considerable period of time,” and the further observation that “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,” . . . in order to ascertain the mean high tide line with requisite certainty in fixing the boundary of valuable tidelands, such as those here in question appear to be, “an average of 18.6 years should be determined as near as possible.”³³

30. *Borax Consolidated, Ltd. v. Los Angeles*, *supra* note 17, at 22, 23 (citing *United States v. Pacheco*, 2 Wall. 587, 590 (69 U.S., 1865)).

31. The Court cited *East Boston Co. v. Commonwealth*, 89 N.E. 236 (1909); and *New Jersey Zinc & Iron Co. v. Morris Canal & Bkg. Co.*, 15 Atl. 227 (1888), as approving the doctrine of *Attorney-General v. Chambers*.

32. *Borax Consolidated, Ltd. v. Los Angeles*, *supra* note 17, at 26. Another objection on scientific grounds to the neap tide rule is that it cannot be a universal rule because while in many regions the principal variation in the rise and fall of the tide is related to the moon’s phase, in other regions the greatest influence is due to parallax (distance of moon from the earth), and in still other regions the principal variation is related to the moon’s declination (distance north or south of the equator). MARMER (1951), *op. cit. supra* note 10, at 6.

33. *Borax Consolidated, Ltd. v. Los Angeles*, *supra* note 17, at 26–27 (citing MARMER, TIDAL DATUM PLANES 76, 81, SPECIAL PUBLICATION NO. 135, U.S. COAST AND GEODETIC SURVEY (1927)). (In the 1951 edition of this publication, the corresponding references are at 86, 87.) (See 6413 A(d) for comments on this reference.) In *United States v. Washington*, 294 F. 2d 830 (Sept. 1961), the Circuit Court of Appeals applied the doctrine of the *Borax* case to define the limits of a grant by the United States along the coast of Washington. On appeal by the State of Washington, the Supreme Court of the United States refused to review the Circuit Court’s ruling. 369 U.S. 817 (1962).

A. COMMENTARY

(a) While the question before the Supreme Court in the *Borax* case was the interpretation of "the line of mean high tide," as used in the grant by the state to the city (*see note 29 supra*), both appellate Courts used the word "mean" interchangeably with "ordinary." The references to *Attorney-General v. Chambers* (*see note 23 supra*), where the word "ordinary" as applied to tides was considered and defined, leaves no doubt that the Court believed the term "ordinary high-water mark" to be synonymous with "mean high-water mark."³⁴

(b) The rule of the common law, as laid down in *Attorney-General v. Chambers, supra*, that the limit of the seashore is "the line of the medium high tide between the springs and the neaps" (*see text at note 25 supra*), is a close approximation of the more exact rule laid down by the Supreme Court in the *Borax* case. This is so because the spring tides occur with the same frequency as the neap tides and generally, though not always, one is as much above a medium plane as the other is below it, and therefore would cancel each other.³⁵ There is a practical value in the use of all the high tides (springs, neaps, and intermediates) for the determination of the plane of mean high water instead of only the high waters between springs and neaps. It is a simple matter to tabulate all the high waters for a given period and obtain an exact mean, but if the intermediate high waters only were to be used there would be a possible margin of error in the selection of the spring and neap high waters for exclusion, unless they are determined by harmonic analysis.

(c) Although diurnal inequality was not involved in the *Borax* case, the principle established should apply equally where the question is whether to use the mean of either of the two highs occurring each tidal day or the mean of all the highs. The two high waters of the day could be considered as corresponding to the spring highs and the neap highs of the month except that the former happen with greater frequency. If then the words "higher high waters" are substituted for "spring tides" and "lower high waters" for "neap tides," then using the language of the court, the following is arrived at: "the mean high tide line . . . is neither the higher high water nor the lower high water, but a mean of all the high waters." (*See text at note 32 supra.*) In this way, the land ac-

34. This conforms to Coast Survey usage. Although the term "ordinary high water" is not one which the Bureau has defined and standardized for survey operations and for technical engineering use, where the word "ordinary" is used in connection with tides, it is regarded as the equivalent of the word "mean." SCHUREMAN (1949), *op. cit. supra* note 2, at 26.

35. There are instances where the excess and deficiency are not the same, albeit the difference is small, and under certain conditions of foreshore slope may have a significant effect on the location of the mean high-tide line.

tually covered by the tides most of the time would be included as part of the shore, which is also the basis for the Court's decision in the *Borax* case.³⁶

(d) The *Borax* case stands for the doctrine that *all* the high tides (spring, neap, and intermediate) not merely neap tides, are to be used for determining ordinary or mean high water (*see* text at note 32 *supra*). In this context, the doctrine is of general application. But the Court specified in addition that in order to determine mean high water at any place *all the high waters*, averaged over a period of 18.6 years or as near thereto as possible, should be used (citing the 1927 edition of *Tidal Datum Planes* (*see* note 33 *supra*)). Considered in this context, the decision must be regarded as of specific application, that is, as applying to areas where the type of tide is the same as that in the inner harbor of San Pedro—two high waters and two low waters during each tidal day.³⁷

(e) The influence of the *Borax* decision is evidenced in the later California case of *Bolsa Land Co. v. Vaqueros Major Oil Co.*, 76 P. 2d 519, 522 (1938), where the District Court of Appeal, although affirming a finding of the trial court that the ordinary high-water mark means the intersection of the tidal plane with the shore and not the run or reach of the water or waves upon the shore, stated (after discussing the *Borax* case): "In the instant case it appears that the trial court erred in not taking into consideration all the tides in fixing the actual mean rise thereof."³⁸

642. ORDINARY LOW-WATER MARK

We come now to the basic tidal boundary problem involved in the *California* case, namely, the criteria to be used in defining "ordinary low-water mark" on the California coast. No judicial standard has thus far been developed for this tidal boundary. The principles developed by the courts and by publicists have applied mostly to high water because at common law that was the upper limit of the shore (property of the Crown) and in turn the boundary

36. By assuming a fictitious tide represented by mean high water, a portion of the land between lower high water and higher high water would be covered with water twice in every 24 hours, but only once every 24 hours if higher high water were taken as the limit of the shore, and would not be covered at all if the lower high water were taken as the limit. The limit of the shore would therefore be defined by the mean high-water line because that part of the land would be covered by the tides most of the time.

37. The reason for this is that where the tide is predominantly diurnal (one high and one low water each day) but with two high waters and two low waters on some of the days of the month, only the higher high waters and the lower low waters are used in computing mean values. This procedure was adopted in order to avoid an imbalance from the use of both low waters or both high waters (*see* Part 2, 1613 for a further discussion of this subject). To reflect this procedure and to make the definitions of mean high water and mean low water of universal application, the word *all* was omitted in the revised 1951 edition of *Tidal Datum Planes* (*see* MARMER (1951), *op. cit. supra* note 10, at 86, 104).

38. For procedural reasons the Court felt it unnecessary to remodel the findings of the trial court, particularly since the main issue involved had been determined.

of private ownership. In this country, it is the dividing line between the tidelands (land between high- and low-water marks), the property of the state, and the upland, the subject of private ownership. (See fig. 20.)

But insofar as the lower limit of the shore or tidelands was concerned, similar questions seldom arose because along navigable waters the shore and the submerged lands beyond the shore were in the same ownership—the Crown or the state—unless it had been granted away. There is thus a paucity of legal precedent on the question raised in the *California* case.³⁹ The case therefore involved a *de novo* consideration of applicable principles by the Special Master.

California's contention that the mean of the lower low waters should be used because that is the datum used by the Coast and Geodetic Survey for its hydrographic surveys and nautical charts along the Pacific coast and by the Corps of Engineers in its work there, would seem to be negatived by the fact that technically the plane of mean lower low water is as distinct a datum as the plane of mean higher low water (see 621 and 631), and that both are different tidal datums from the datum of mean low water.⁴⁰ Also, the selection of a datum for nautical charts is bottomed primarily on safety in navigation and is not necessarily related to a tidal datum for the determination of property boundaries.

Technically, the planes of low water and lower low water with respect to the fall of the tide are comparable to the planes of high water and higher high water with respect to the rise of the tide. Since the outer limit of the shore or tidelands is the ordinary low-water mark, if the reasoning of the *Borax* case with respect to ordinary high-water mark is followed, the limit would be

39. Neither the State of California nor the United States cited any direct legal authority to uphold their respective views. In *East Boston Co. v. Commonwealth*, 89 N.E. 236 (1909), where the question was what level was meant by the term "ordinary low-water mark" in a grant of flats under an order issued in 1640, it was held that "the word 'ordinary,' when applied to a high or low water mark, has generally been used in the sense of average by the courts of this country and of England" rather than "extreme low water" (citing cases in England, Massachusetts, Virginia, New Jersey, South Carolina, Connecticut, Rhode Island, and in the Federal courts). Because of the use of the word "ordinary," the court distinguished this grant from the colonial ordinance of 1647 extending the line of individual ownership as far as the tide ebbs, if not more than 100 rods from ordinary high-water mark, which "for reasons stated in decisions," the court said, "means the line of extreme low water shown at an ebb of the tide, resulting from usual causes and conditions." *Id.* at 237, citing *Wonson v. Wonson*, 96 Mass. 71 (1867). (This case dealt with the subdivision of flats within a cove.) It should be noted that the tide at Boston is of the semidaily type with small differences between morning and afternoon tides. In *FARNHAM, WATERS AND WATER RIGHTS* 227, 228 (1904), it is stated that shore is "that strip lying along tide water over which the tide flows between the line of ordinary high tide and the line of lowest tide." Citations are given to cases in Texas, Alabama, Rhode Island, Connecticut, Delaware, Massachusetts, and Washington, but only *Galveston City Surf Bathing Co. v. Heidenheimer*, 63 Tex. 559, 563 (1885), lends support to the above statement. No authority is, however, given by the Texas court for the use of "the line of the lowest tide" as the seaward boundary of the shore at common law, nor was the lower limit of the shore at issue. The court's statement is at variance with what is generally accepted as the common law definition of "shore," namely, that it is confined to what is covered by "ordinary" tides (see text following note 23 *supra*).

40. *MARMER* (1951), *op. cit. supra* note 10, at 122.

neither the line of lower low water nor the line of higher low water, but a line based on the mean of all the low waters (*see* 6413 and 6413 A(c)).⁴¹

6421. *Findings of the Special Master*

In his report to the Supreme Court, the Special Master found that “the ordinary low-water mark on the coast of California is the intersection with the shoreline (as it exists at the time of survey) of the plane of the mean of all low waters, to be established, subject to the approval of the Court, by the United States Coast and Geodetic Survey from observations made over a period of 18.6 years.”⁴² He predicated this finding on the consideration of property rights, stating that, from the point of view of a disputed real estate boundary line, there would “be no more reason to choose the mean of the lower low tides (as one interested claimant might suggest from self-interest) than to choose the mean of the higher low tides (as self-interest might likewise move the other claimant to suggest).” In the Master’s view, “the middle way—the statistical mean of all the low tides over the cyclical period of approximately nineteen years—would seem to be the only choice of which neither contestant could justly complain.”⁴³

This equitable approach to the interpretation of the term “ordinary low-water mark,” while achieving a correct result, fails to establish a sound guiding principle (*see* note 35 *supra*). If one claimant had contended for spring tides and the other for neap tides, the middle way would not necessarily be the correct answer. The problem is technical in nature and lends itself to a technical approach, the basis for which is the consideration that where a variation in any phase of the tide exists (i.e., high or low), each having equal significance in the tidal cycle, the mean of the heights is more representative of that level than any single height when taken alone. If this principle is applied to the low-water phase of the tide at San Francisco (*see* fig. 17), it is obvious that the mean of the two low waters occurring each tidal day is more repre-

41. Shore is defined as the land that is covered and uncovered by the flux and reflux of the tide. With respect to the upland (land above high water), it is the land that is covered by the flux of the tide, but in relation to the submerged lands (land below low water) it is the land that is uncovered by the reflux of the tide. Thus considered, the mean of all the low waters would uncover the shore a greater part of the lunar cycle than would either the spring low water or the neap low water or either the lower low water or the higher low water (*see* note 36 *supra*).

42. Report of Special Master, *United States v. California*, Sup. Ct., No. 6, Original, Oct. Term, 1952, at 4, 5. Ordered filed Nov. 10, 1952, 344 U.S. 872 (1952) (cited hereinafter as Final Report of Special Master).

43. *Id.* at 39-40. This he believed was also the effect of the *Borax* decision with regard to “ordinary high-water mark” (*see* 6413A(c)).

sentative of the technical concept of low water than is either higher low or lower low when considered alone. Or viewed in another way, a low water at San Francisco occurs every 12 hours (taking into account all the low waters), whereas a higher low water or a lower low water occurs only every 24 hours. It would therefore be technically correct to regard the mean of the two low waters as the "ordinary" or "usual" low water as distinguished from the higher low or lower low which could relatively be classed as the "extraordinary" or "unusual" low water. It is for this reason that the Survey considers the word "ordinary" when applied to tides as the equivalent of the word "mean."⁴⁴ The determination of "ordinary low water" at any place thus becomes a matter of determining "mean low water," which is defined as "the average height of the low waters at that place over a period of 19 years."⁴⁵

There is one observation that the Special Master made in his recommendation on "ordinary low-water mark," which leaves the final decision somewhat uncertain. He says the testimony established that "to a man skilled in the art, the lay expression 'ordinary low water' would be taken to mean the same thing as the more exact technical term 'mean low water,' " but, he says, nothing has been brought to his attention to indicate that the Supreme Court, when it used the expression "ordinary low water," "purposely intended to choose the mean of all the low waters as distinguished from the mean of the lower low waters." In other words, in his view the question has not been judicially determined. He therefore based his recommendation on the basis of property rights.⁴⁶

As to California's contention that the mean of the lower low waters is used on the Bureau's nautical charts along the Pacific coast, the Special Master noted that the reason for such use is that it is safer and therefore more serviceable to the navigator, citing the Director's letter of February 8, 1952, to the Solicitor General (*see* Appendix E). He recognized, however, that it would be more convenient for navigators, in approaching the coast and interested in locating the outer boundary of the marginal belt, to use the chart datum. But, he said, there was no evidence that the State Department had made any choice in our

44. SCHUREMAN (1949), *op. cit. supra* note 2, at 26.

45. MARMER (1951), *op. cit. supra* note 10, at 104.

46. Final Report of Special Master, *supra* note 42, at 43. This observation of the Special Master does not seem to take into account the fact that the word "ordinary" in connection with tidal boundaries has been used in judicial decisions from a very early date, both in England and in this country, and that the Supreme Court itself gave the first precise interpretation of the word "ordinary" with respect to "high-water mark" (*see* 6411 and 6413). A presumption would thus be raised in favor of the Court being cognizant of its applicability to "low-water mark," and that the question on which the Court sought recommendation from the Special Master concerned the actual method of locating the "mean low-water mark" along the California coast, particularly with reference to the date of establishment and to natural and artificial changes.

international relations.⁴⁷ In his view, the choice of mean lower low water is a matter of international policy for the political agencies of government to determine, rather than for judicial determination, as is the question whether moving the international domain farther seaward would best serve the national interest.⁴⁸

6422. *Changes in Low-Water Line*

Coupled with the primary question of the meaning of ordinary low-water mark was the secondary question of the date of establishment of the low-water mark. California entered the Union in 1850. She then became vested with ownership of its tidelands. The question that presented itself was what effect should be given to changes in the low-water line, both natural and artificial, that have occurred since that date. This was necessary to be determined before the boundary could be established by actual survey.

A. FROM NATURAL CAUSES

It is an established principle of riparian law that where the sea or an arm thereof is a boundary, the doctrine of accretion and erosion is normally applicable; that is, gradual and imperceptible changes, brought about by accretion or reliction (a deposit of alluvial soil or recession of the water) or by erosion or submergence (a washing away of the soil or an encroachment of the water), operate to change the boundary of the riparian land.⁴⁹ In California, as in almost all states, the boundary of upland bordering on the sea is the ordinary high-water mark. In a few states, however, the general rule has been modified and the ownership of upland along the shore of the sea extends to low-water mark, but, where this is the case, the general doctrine as to natural accretion and erosion applies and the boundary shifts with changes in the low-water mark resulting from such natural causes.⁵⁰

47. Because of the probable scale of the charts used, there would be little difference from a practical point of view whether the outer boundary of the marginal belt was measured from the mean low-water line or from the mean lower-low-water line. Assuming a vertical difference of 2 feet between the planes, a 1 percent slope, and a chart scale of 1:200,000 (the approximate scale of the present General Charts along the Pacific coast), the horizontal distance between the mean low-water line and the mean lower-low-water line would be about 1/80 of an inch at the scale of the chart, a hardly significant amount. This, of course, should not be confused with the ground intersection of these two planes with the shore, which was the problem before the Special Master.

48. *Id.* at 41-43. On the question of moving the international domain farther seaward in the interest of national security, see 54 at note 30 *et seq.*

49. *Oklahoma v. Texas*, 268 U.S. 252, 256 (1925). This has been held to be applicable in California. *Strand Improvement Co. v. Long Beach*, 161 Pac. 975, 977-978 (1916).

50. *Burke v. Commonwealth*, 186 N. E. 277, 279 (1933) (Mass.).

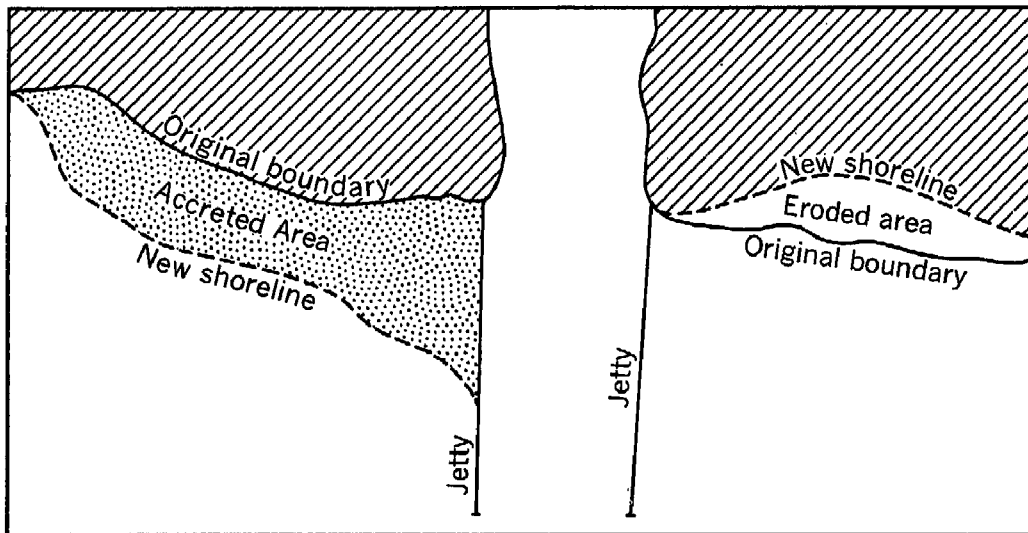


FIGURE 21.—Natural accretion or erosion resulting from artificial structures, such as jetties, shifts the riparian boundary according to federal law, but retains its original location according to California law.

Since the line to be determined in the *California* case was the line between state-owned tideland and the marginal sea, the State of California was, in this respect, a riparian owner of land abutting on the ocean. Hence, like other riparian boundaries, this line (ordinary low-water mark) would shift with those changes in the shoreline that are gradual and imperceptible and are the result of the natural processes of accretion and erosion.

The parties were in agreement on this general doctrine of riparian law and considered it applicable to the situation in California.⁵¹

(a) *Natural Causes Induced by Artificial Structures.*—A special problem is presented where artificial structures, such as jetties or breakwaters, have been erected into the marginal sea, and, thereafter, by gradual and imperceptible processes, natural accretions to the shoreline occur as a result of the artificial structures. As applied to California, two rules exist—the federal rule and the California rule. (See fig. 21.)

The rule applied in the Federal courts is to treat the changes in the shoreline in the same manner as those resulting from natural accretion or erosion and to

51. As a practical matter, many difficulties would arise if the line to be established were of some early date. Unless some cartographic determination existed showing the location of the mean low-water line as of the date in question that could be coordinated with present physical features, there would be no possible way of reestablishing such line on the ground. Many of the early surveys of the Bureau along the California coast, particularly in the more exposed areas, fail to show a low-water line.

hold that the adjacent riparian owner gains or loses from the change.⁵² In California, however, a different rule is applied, with accretions so added being regarded as artificial in character, and, as against the state or its grantee, the riparian owner is not entitled to claim such accretions.⁵³ California's position in the present controversy happened to coincide with the federal rule, so the parties were in agreement that such accretions belong to California rather than to the United States, leaving no issue for the Special Master to resolve on this question.⁵⁴

B. FROM ARTIFICIAL CAUSES

There remained for consideration the question as to what modification should be made in the low-water line as a result of changes due to artificial causes. It is a rule of riparian boundary law that changes brought about by artificial causes, such as the deliberate filling or dredging of an area, have no effect on the title to the area so filled or dredged.⁵⁵ The United States sought to apply this rule to the California coast. It contended that construction of such fills cannot of itself operate to transfer to the state title to the underlying lands; therefore, full dominion and power over the lands, minerals, and other things underlying such filled areas remained in the United States, and the boundary would have to be determined as of the date of the artificial construction (citing cases in the courts of California, New Jersey, New York, and Iowa).⁵⁶ California, on the other hand, contended that the rationale of the *California* decision, namely, that control of the marginal sea was essential to the fulfillment of the Federal Government's responsibilities in matters of national external sovereignty, leaves no doubt that what was contemplated were responsibilities in the marginal sea as it now exists, not in the area that might have existed in 1850 or at any other time since then.

52. *County of St. Clair v. Lovington*, 23 Wall. 46, 66-69 (90 U.S., 1874); *Jackson v. United States*, 56 F. 2d 340, 342-343 (1932).

53. *Carpenter v. City of Santa Monica*, 147 F. 2d 964, 972-975 (1944).

54. Final Report of Special Master, *supra* note 42, at 44. The position of the United States on this was that since the case was in a Federal court and involved the ascertainment of a right asserted under federal law, it presented a federal question under authority of *Borax Consolidated, Ltd. v. Los Angeles*, 296 U.S. 10, 22 (1935). In addition, it believed that in the interest of uniformity one single rule should apply to all the coastal states even though in this instance the special rule of a particular state happens to be favorable to the United States. Brief for the United States before the Special Master, *supra* note 4, at 162-163.

55. This appears to be the rule in California. See *Patton v. City of Wilmington*, 147 Pac. 141, 142 (1915).

56. As to the improvements which may have been made on these filled areas, the United States took the position that it does not claim title to them nor did it propose to take over any such improvements. Final Report of Special Master, *supra* note 42, at 44-45. In the Government's view, two relationships were involved—the internal relation between the states and the Federal Government, and the relation between the Federal Government and foreign nations.

The Special Master accepted the position of California as the legally sound one. In his view, "the contention that the boundaries of the marginal belt are at one place as between the United States and an individual State and at another, different place as between the United States and a foreign nation, is unsound on the general principle underlying the judgments in the principal case [the *California* case] and the *Texas* and *Louisiana* cases."

This decision of the Master was influenced by the fact that in the construction of future artificial accretions the United States will have full control because of its control over navigable waters. This would give opportunity for appropriate negotiations and agreements between the state and the United States at the time the artificial change is approved.⁵⁷

Therefore, on the whole question of tidal boundaries, the Special Master recommended that the ordinary low-water mark *as it exists at the time of the survey* be accepted as the boundary between federal and state jurisdiction, regardless of whether changes have resulted from natural accretion, from natural accretion induced by artificial structures, or from artificial accretion.⁵⁸

57. *Id.* at 45-47. Except for the fact that a negotiated agreement would be reached, the same dual status, which the Special Master believed to be an unsound one, would result in the future where accretions were contemplated. But, in reality, it is not the boundaries of the marginal belt that are at two different places under the Government's view. There can be only one inshore boundary of the marginal belt—at the present low-water mark. That is one aspect of the *California* decision. The other is represented by the concept of property rights predicated upon the Court's holding that "California is not the owner of the three-mile marginal belt along its coast" (332 U.S. 19, 38). If it is not now the owner, then it never was the owner and that status would revert to the year 1850, when California became a state, unless the Supreme Court chose to set the cut-off date as of the date of its decision. In *United States v. Louisiana*, 339 U.S. 699 (1950), the Court set the date of accounting by Louisiana to the Government as of June 5, 1950, the date of its decision. 340 U.S. 899 (1950).

58. Final Report of Special Master, *supra* note 42, at 4.