Chapter D

Basic Law of Water Boundaries

D1

Introduction

Natural barriers have formed ownership boundaries since our earliest history. Natural features such as rivers, lakes and oceans have become important legal boundary monuments.

The rights and privileges conferred upon owners of land bounded by water take many forms and have given rise to the use of special terms to describe various legal aspects of water boundaries.

A **riparian owner** is one who owns property along the bank of a watercourse, including a lake, and whose boundary is the water in that course or lake.

The word riparian has as its root the Latin "ripa" meaning river bank.

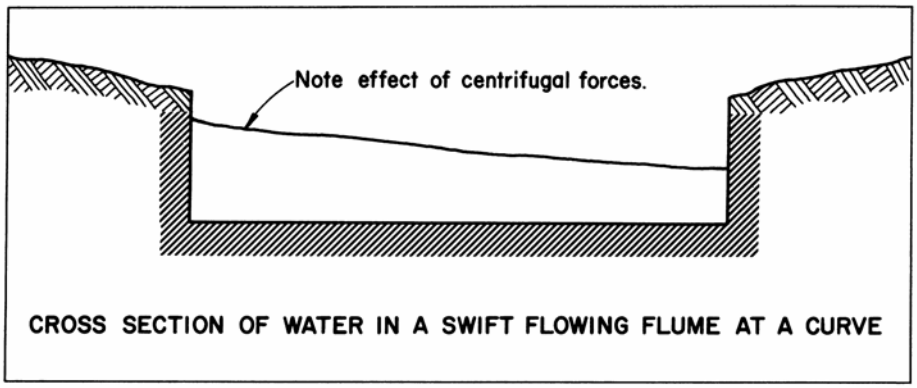
A **littoral owner** is one who owns land abutting a sea or ocean where the tide regularly rises and falls. Littoral is derived from the Latin "litus" meaning seashore or coast. In common usage the word riparian is often used instead of littoral to include seashore boundaries as well as inland water boundaries.

The word **accretion** is derived from the Latin “accrescere" which means to grow or to increase. Accretion is the gradual and imperceptible addition of soil by gradual deposition through the operation of natural causes, to that already in possession of the owner. It is the gradual intrusion of the dry land area into the water area. Accretion is formed by the washing up of sand, silt or soil so as to form firm ground, called alluvion.
The term **alluvion** is more generally applied to the deposit itself while the term accretion usually denotes the act; however, in common practice, the two terms have been used more or less interchangeably.

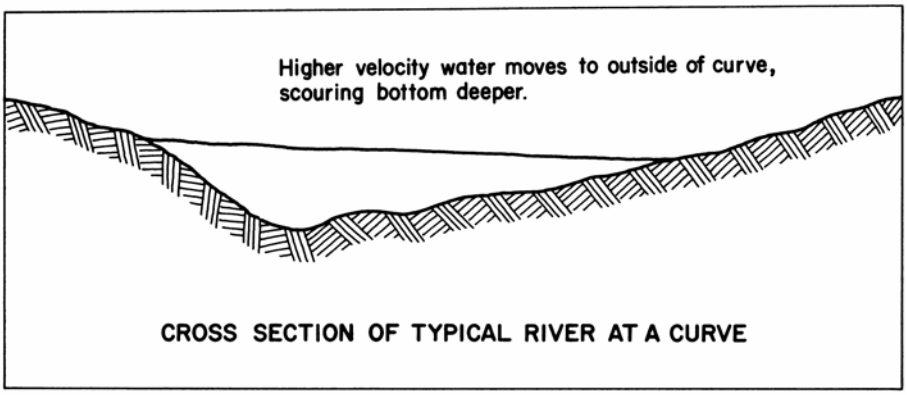
Reliction is dry land formed by the withdrawal of water from the shores of a river, lake or sea. For example: a twin channel stream in which one channel degrades sufficiently to cause the gradual withdrawal of water from the other channel until it becomes a waterless relic. The process of the water withdrawal is termed dereliction.

The word **erosion** is derived from the Latin prefix “e" meaning out and "rodere" meaning to gnaw. Erosion is the direct opposite of accretion. It is the gradual eating or gnawing away of soil by the operation of water so that the water encroaches upon an area that was dry land prior to the erosion.

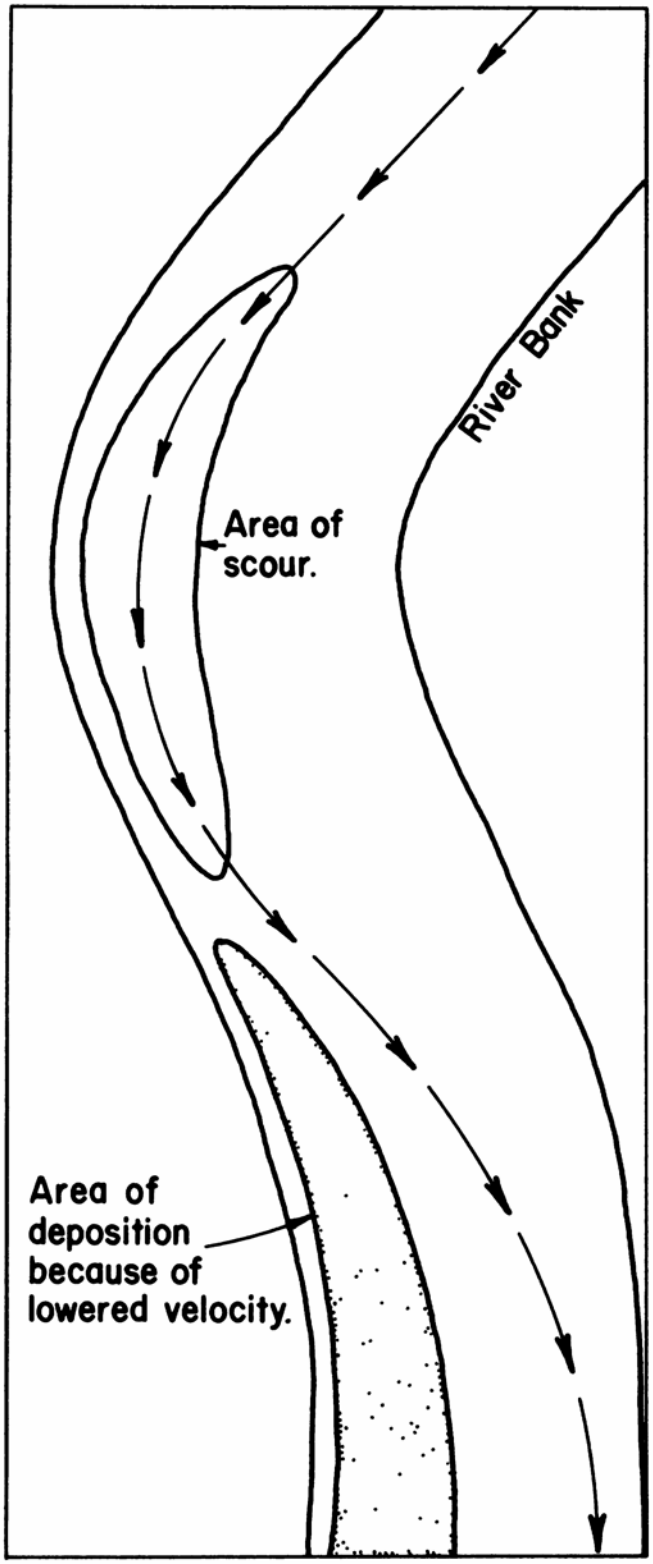
Avulsion is the sudden and perceptible action of water which causes the removal of a considerable quantity of soil from the land of one owner and its deposit upon or annexation to the dry land of another. This may be a sudden or rapid change in the course and channel of a river or the sudden creation of a completely new channel. It is distinguished from accretion and erosion by the time element. Avulsion is sudden; accretion, reliction and erosion are gradual.



CROSS SECTION OF WATER IN A SWIFT FLOWING FLUME AT A CURVE



CROSS SECTION OF TYPICAL RIVER AT A CURVE



Historical Development

From the earliest times in England, the common law vested title to and control over navigable waters in the Crown and in the Parliament. A distinction was made between title and control. Ownership of the underwater soil, similar to ownership of dry land, was regarded as a proprietary right and was vested in the Crown. But the right to control both land and water was deemed a public right. Thus the Crown could and did convey the soil under water so as to give private rights therein, but the dominion and control over the waters, in the interest of navigation and commerce for the benefit of all the subjects of the kingdom, could be exercised only by Parliament.

The one clear right of the public in the use of water was for travel. In medieval England, the general public exerted few other demands for water use. Water was sufficiently plentiful so that there were few conflicts concerning its use. Where there was conflict with the public right of navigation the right of navigation prevailed and was recognized under medieval common law.

The original source of land titles in England is a grant from the Crown. Most titles to land on the English seashore date as far back as the grants of King John, whose reign ended in 1216. In those early days in England, the initial grants of coastal lands presented no great problems, so it is not surprising that the grants were imprecise and incomplete, particularly in their lack of description of the seaward boundary. As might have been expected, the grantee of land along the coast came to look upon his property as extending down to the sea. Either the Crown acquiesced in that view or there were matters more pressing and interesting to the Crown than the use of the barren seacoasts. No challenge was made to the private use and occupancy of the tidelands until the latter part of the sixteenth century. Until then it just never occurred to the Crown, or anyone else for that matter, to be specific about seacoast boundaries in conveyances.

In 1568-69 Thomas Digges, a mathematician, engineer, astronomer and lawyer, wrote a short treatise asserting that the tidelands had not been included in grants of the seacoasts by the Crown. This thesis was the basis for a few legal actions brought by the Crown, over a considerable period of time, without success until 1632. Digges' thesis appeared again in 1670 in the now classic treatise by Sir Matthew Hale, De Juris Maris. The impact of this treatise was such that the burden of proof was placed upon the subject to show that his land extended to the low water mark.

That was the state of development of English law at the time England was colonizing the eastern coastline of North America. After the American Revolution, the Thirteen Original Colonies became sovereign states, and as successors to the Crown, became vested with title to all lands within their boundaries over which the tide ebbed and flowed and to the beds of inland navigable waters (1).

With the adoption of the Federal Constitution, the states ceded to the United States certain powers, one of which was the right to regulate interstate commerce and with it the accompanying right to control navigation. The new states retained the boundaries they had as independent sovereigns. No title to the tidelands or to the land submerged by

navigable water was thereby conferred upon the United States Government. The individual states owned their tidelands and exercised authority over the lands and the waters beyond the tidelands extending to the state boundaries. In all respects, the state succeeded to all the rights and powers of the Crown and of Parliament in the matter of navigable waters and the soil under them (2).

New states entering the Union, subsequent to the adoption of the Constitution, were admitted on an equal footing with the original states and therefore acquired the same right in submersible and submerged lands (3). However, each state has dealt with this matter according to its own views of justice and policy. A study of the laws of the original states shows that there is no universal or uniform law on the subject. Great caution is therefore necessary in applying precedents in one state to cases arising in another.

Navigable Waters

Under English common law, all streams over which the tide ebbed and flowed were deemed navigable and the beds thereof were owned by the Crown. All streams or bodies of water which were not affected by tide were nonnavigable and the adjacent landowners held title to the center of the stream or lake. This test for the determination of navigability was not adapted to the conditions of this country where many large rivers and other bodies of water were susceptible of being used as highways of commerce. Hence, this common law test in the great majority of states has been either repudiated or modified. The common la\v doctrine has been uniformly rejected by the Supreme Court of the United States. It has ruled that streams that are navigable in fact are navigable in law regardless of the presence or absence of a tide (4). However, the rule of law that the landowners adjacent to nonnavigable water hold title to the center of the water was carried over to the Federal law (5) and has been adopted by the majority of the states. 43 USC 931 reads as follows:

All navigable rivers within the territory occupied by the public lands, shall remain and be deemed public highways; and, in all cases where the opposite banks of any streams not navigable belong to different persons, the stream and the bed thereof shall become common to both.

Controlling law

Questions regarding passage of title from the United States to the patentee must be resolved by the laws of the Federal Government whether in State or Federal courts. Once it is determined that title has passed, the property, like other property in the state, is subject to state legislation. The state legislation must be consistent with the admission that the title passed and vested according to the laws of the United States (6).

The grants from the Government of lands bounded by streams and other waters, without any reservation or restriction of terms, are to be construed, as to their effect, according to the law of the state in which the lands lie (7).

Accreted land Ownership

The general legal principles concerning water boundaries and the ownership of accretion was settled at common law in England (8) before the United States gained its independence. The general rules concerning accretion are still followed in the United States with some modifications to fit special circumstances. The general rule is that ownership of accreted land inures to the upland riparian or littoral owner while avulsive action does not work a boundary or an ownership change.

After a boundary has been moved by accretion, reliction or erosion, an avulsion may occur. The moment of the avulsion determines the location of the ownership boundaries. If the stream is navigable, the state owned the stream bed prior to the avulsion and remains the owner after the avulsion. The abutting proprietors owned to the stream banks before the avulsion, and they still own to the stream banks after the avulsion. The land positioned under the water after the avulsion is still owned by the person who owned it prior to the avulsion, but he cannot close the new channel to navigation. If the stream is nonnavigable, the owners on each side of the stream own to the center of the stream before the avulsion and they continue to own to the center of the dry stream bed after the avulsion. It depends on local law as to the method of determing the center, or thread, of the stream.

Ownership of the dry land area formed, or caused by reliction is determined on the same principles as those used in determining the ownership of accreted land. This general rule is followed in the United States by the Federal Government (9) and the majority of the individual states (10).

The Constitution of the State of Washington contains the following provision: Article XVII, Paragraph 1, "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, and up to and including the line of ordinary high water within the banks of all navigable rivers and lakes: provided, that this section shall not be construed so as to debar any person from asserting his claim to vested rights in the courts of the state."

In 1966, this provision was interpreted by the Washington State Supreme Court to give the State ownership of all accreted land fronting unpatented littoral upland that was in place at the date of statehood, November 11, 1889, and to give the State ownership of all littoral land that was formed by accretion since November 11, 1889 (11). In the case before the court, the original patent was issued prior to the admission of Washington as a state. The U.S. Supreme Court accepted an appeal and ruled that Federal law applied in this case. Therefore, the upland littoral owner was declared to be the owner of all the accretion fronting the patented ocean front lots (12).

Despite the existence of Article XVII of the State Constitution, Washington courts have recognized the majority common law rule of accretion for stream front property owners (13).

By state law, Louisiana claims all accretions in the Gulf of Mexico.

Accretion after Survey, Before Patent

It is possible for accretion to form in front of surveyed lots before the land is entered for settlement and claim. The general rule is that such accretion passes to the patentee although the patent describes the land according to the official survey plat (14).

An exception to this general rule is recognized if a substantial amount of accretion has built up prior to entry for patent. In cases of substantial accretion between survey and entry for patent, the United States retains title to the accretion outside the meander line as unsurveyed land (15).

Re-emerged lands

Another legal problem to be considered is that of re-emerging lands. If a river slowly erodes the riparian lots along a shore line until the remote lots (which originally were not riparian) become riparian and then the river reverses the process and accretion is built up, replacing the previously eroded riparian lots, these lands are termed re-emerged. Under the Federal common law, the re-emerged lots reacquire all their former rights, the same as though they had never been eroded (16).

Most states follow the Federal Rule (17). However, some state courts hold that when the land is lost by erosion, the boundary lines and property ownership are extinguished. The remote owner then becomes a riparian owner and future accretion attaches to the once remote land (18).

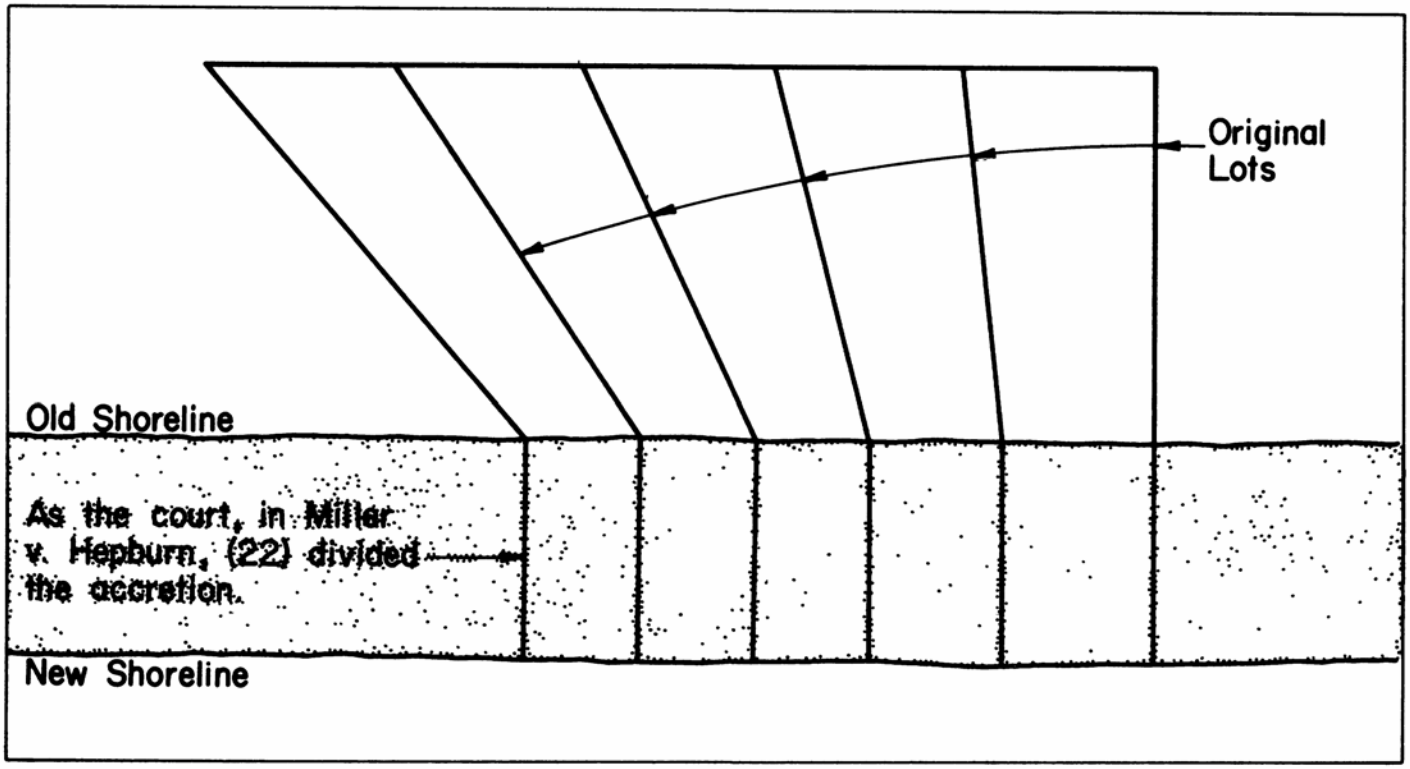
Lands that re-emerge by accretion to the opposite bank of the stream do not regain their identity even though they may occupy the same geographical position they held before the stream moved (19).

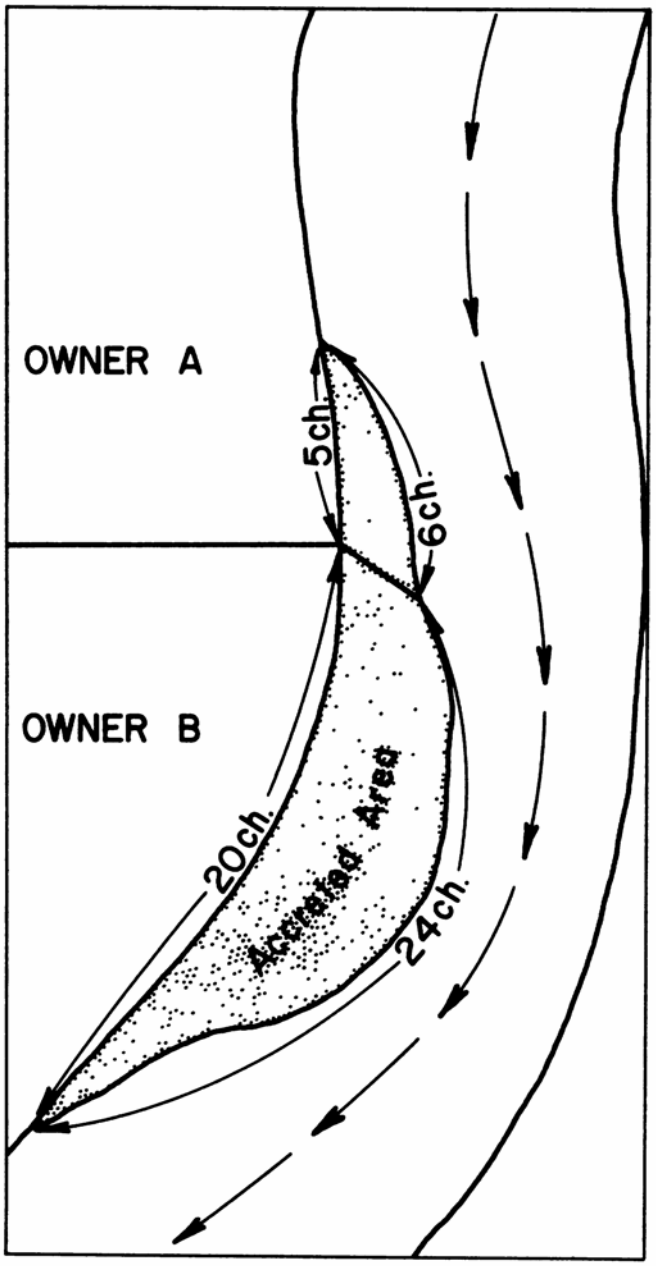
Apportioning the Accretion By Survey

In dividing the accretion among the various riparian owners on the same side of the body of water, the objective is to do so with equity and justice to each owner. Two primary factors must be considered in making the equitable distribution. The first is that the owners shall have an equal share, in proportion to their lands, of the area of the newly formed land; the other is to secure to each an access to the water with an equal share of the new waterline in proportion to his share on the old line of the water (20).

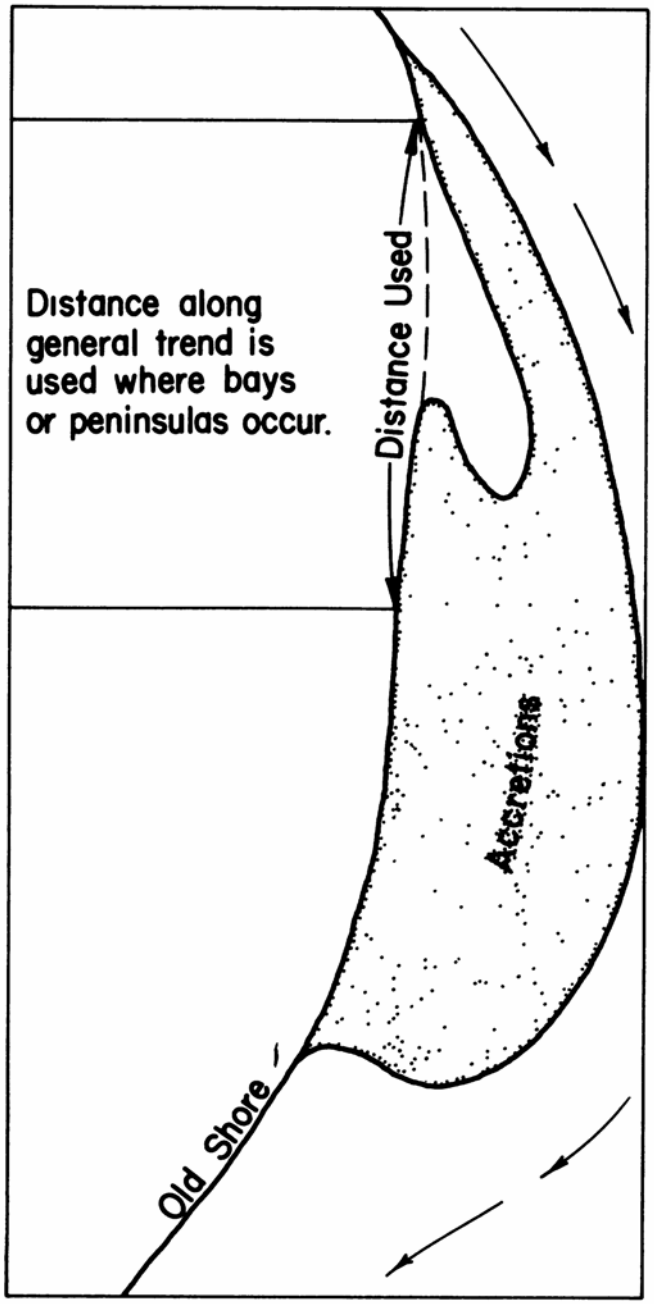
All courts that have been called upon to decide the ownership and division of accretion have subscribed to the doctrine of equity and justice. The four basic methods formulated to achieve equity and justice among the various claimants are:

1. The proportionate shoreline method (21).
2. The perpendicular method (22); also used in the broad sense to include radial lines on curves.
3. The prolongation of the property line method (23).
4. The proportionate acreage method (24).





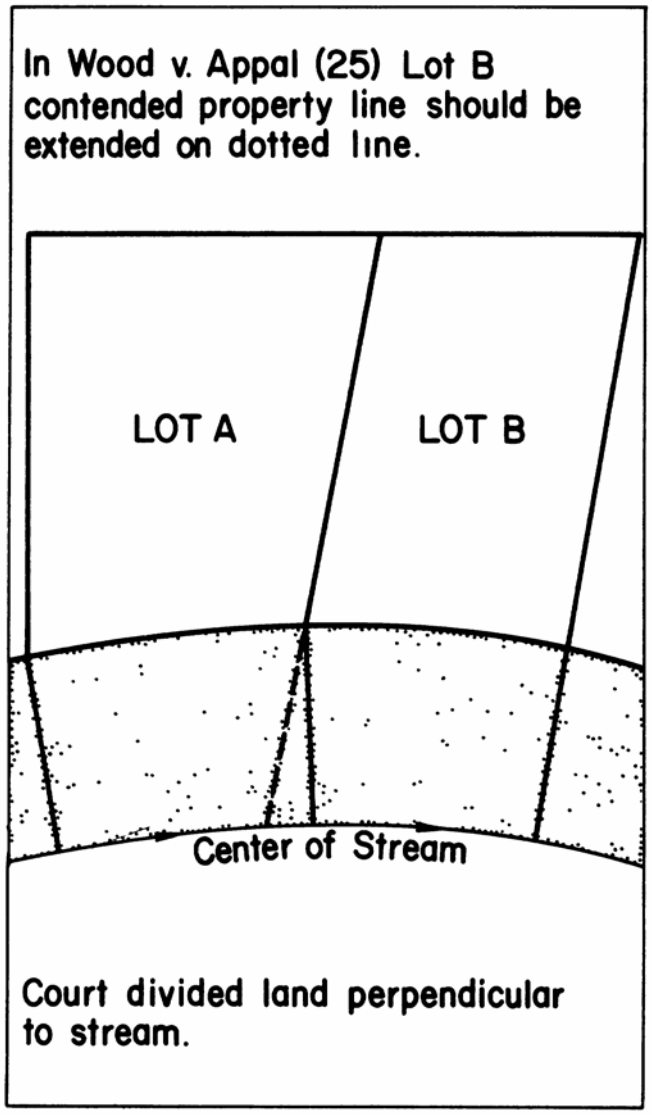
The method used by the Federal Government, wherever possible, and by a majority of the states, is the proportionate shoreline method. This method is outlined in Johnston v. Jones and recommended by the Manual of Surveying Instructions, 1973, sections 7-58 to 7-67. This method, stated briefly, is to apportion the new frontage along the water boundary in the same ratio as that along the line of the old water boundary.



Certain modifications may be required under particular circumstances where peninsulas or bays would make strict apportionment inequitable.

A beginning and ending point for apportionment may have to be established by one of the other methods before the affected land can be apportioned.

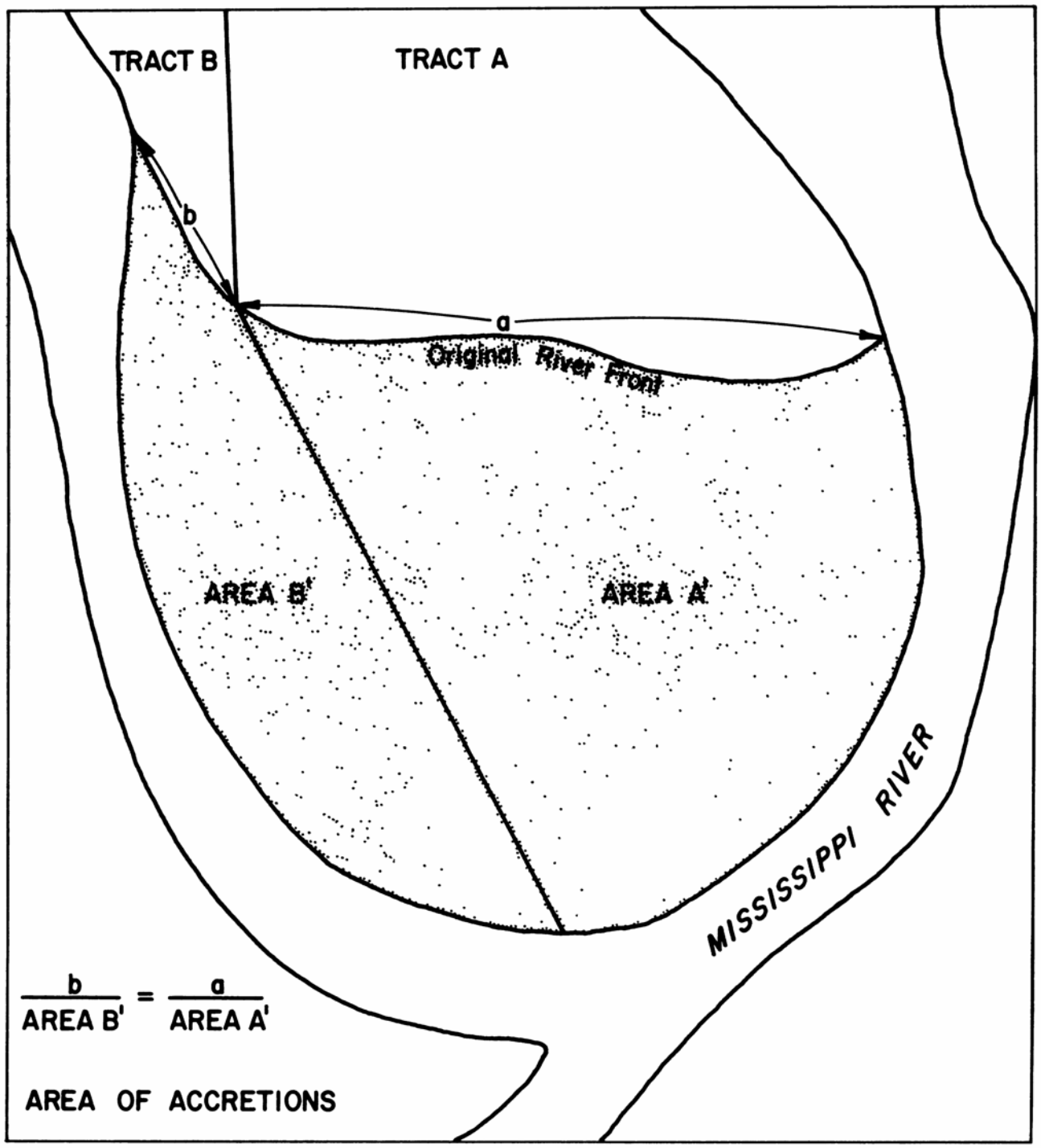
The second preference is the perpendicular method whereby a line is drawn from the boundary termination point on the original shoreline perpendicular to the thread of the stream or the new shoreline, depending on the ownership of the land under the water.



In the absence of accretion, the perpendicular method is preferred to divide the stream bed when the riparian owners own the stream bed also (25).

The prolongation of the property line method is simply to prolong the property lines until they reach the edge of the water. This method is rarely used.

The proportionate acreage method has been used in Louisiana. This method is used where the accreted land is more valuable than the waterfront. In this method contiguous riparian owners each take their proportionate share of the accreted land based on the total extent of their front lines, related to the total quantity of accreted land to be divided.



If the owners are on opposite sides of the boundary water and the water dries up, the point of contact between the properties is the new boundary (26).

Other methods of division have been used in special situations. See Clark, On Surveying and Boundaries or Brown, Boundary Control and Legal Principles or other texts on boundaries.

The Meander Line

One problem related to water boundaries is the precision of the survey delineating the water boundary. If the meander line is reasonably close to the actual edge of the water being meandered, the edge or center of the water, as is applicable, is the true boundary (27). The meander line does not need to follow the waterline exactly. If small tracts of land of little value at the time of survey lie between the meander and the edge of the water, title to such land will pass to the upland owner with the patent to the fractional section (28).

The patent usually conveys title to the actual water line and not to the meander line; the meander line is determined as a matter of surveying convenience.

There are two exceptions to this, however:

1. If, at the time of survey, there was a substantial amount of land between the survey line and the actual shore because of fraud or gross error in the survey, the meander line will be treated as the true boundary.

2. If a substantial amount of land was formed by accretion between the survey line and the actual shore during the period between the survey and the time of entry, the meander line will be treated as the true boundary.

The key phrase in the application of these exceptions is “substantial amount of land."

It has been adjudicated that title to land between the meander line and water edge passed to the patentee of the adjacent upland by reason of the patent without express description in the following situations:

1. The upland owner claimed about 271 acres with about 98 acres of the total lying between the meander line and the water edge. The meander line was about 4000 feet long with about 1200 feet maximum distance between the meander line and the water edge (29).

2. The upland owner claimed about 320 acres with about 112 acres of the total lying between the meander line and the water edge (30).

In cases where the upland owner gains title to the land between the meander line and the edge of the water, he becomes a riparian owner with all the rights and burdens that accompany riparian ownership.

Omitted land

If a meander line is mistakenly run, whether through fraud, gross error or the erroneous assumption of the existence of a body of water where there is no such body of water, riparian rights do not attach because the condition upon which they depend does not exist. In such cases the meander line becomes a fixed boundary. If the meander line borders a swamp instead of a body of water it may be used as a fixed boundary (31).

Upon the discovery of fraud or gross error it is within the power of the land Department of the United States to deal with the area which was excluded from the survey, to cause it to be surveyed and to lawfully dispose of it. In order for the land outside the meander line to be considered omitted, it must be substantial in comparison with the adjacent platted lots.

It has been adjudicated that land was omitted in the following situations:

1. From about 770 acres claimed, about 600 acres were outside the meander line (32).

2. About 280 acres were outside the meander line (33).

3. A lake of about 800 acres was meandered to show about 1800 acres. In some places the edge of the water was more than one half mile from the meander line (34).

4. In a township where about 21,800 acres were being claimed, about 8,000 acres had been excluded by meander lines (35).

5. With a meander line about 1,635 feet long and a total claim of about 53 acres, about 40 acres were outside the meander line (36).

6. No lake existed but meander lines excluded an area of about 850 acres (37).

7. From about 133 acres claimed, about 85 acres were outside the meander line (38).

8. Two tracts were outside the meander line; one at least 160 acres and the other more than 200 acres (39).

9. Two lakes were meandered as one, leaving about 415 acres between them within the confines of the meander line (40).

10. From about 435 acres claimed, about 320 acres were outside the meander line (41).

Omitted land Administrative Procedure

Anyone desiring a survey of omitted public land must make application with the BLM office for the state in which the lands are situated (42).

Notice by the applicant, including government agencies, of intention to apply for the survey of an island or other land omitted from the original survey must be served on the adjacent land owners. Notice must also be served on the Attorney General and the Secretary of State for the state in which the land is situated. The notice is required at least 30 days prior to the date of application for the survey. Service may be by registered mail or in person, evidence of which may consist of the registry return receipt or signed acknowledgment of service. A copy of each notice, with proof of service thereof, must be filed with the application. Failure to obtain evidence of service may be explained (43).

If these and certain other application formalities are followed by the survey applicant (44), and the application for survey is approved, the costs of the survey will be borne by the Government (45).

In surveying the omitted land the Government need not give formal notice to the adjacent landowners. The applicant has already given notice of the application for survey and a survey in itself is not an eviction of the person in possession (46).

After the survey has been approved in the manner normal for any original survey, the manager of the land office is instructed to prepare the public notice for printing in the Federal Register (47). The survey plat is not considered officially filed in the land office until the announced date published in the Federal Register (48).

Omitted land remains Public Domain and can be surveyed in any manner prescribed by Congress.

Unsurveyed Islands

Whether the United States may hold islands as unsurveyed public domain, subject to survey and sale or other disposition under the public land laws and regulations, or whether ownership is controlled by state laws, depends upon the date of formation of the island.

If the island was in existence, separate and distinct from the opposing mainland and above the mean high-water elevation of a meandered body of either navigable or non-navigable water on the date of that state's admission into the Union, then it may be held as public lands of the United States even though the United States may have parted with its title to the opposing mainland (49). That is because such an island was not a part of the bed of those waters and therefore its title remained in the United States after admission of the state. It would therefore be subject to survey and disposal when so identified. However, the land Department may refuse to survey islands considered insignificant (50). If the land Department refuses to survey the island, no citizen can overrule the action of the land Department (51).

If the island has formed since the date of statehood by the depositing of materials, either by man or nature, or has been uncovered by the lowering of the mean, high-water elevation of the body of water, then it may not be held as public domain (52). Its ownership would then rest in the state and be governed by state laws through the state's inherent sovereign rights to the beds of navigable waters.

Islands have been claimed as public domain and surveyed in navigable streams (53), navigable lakes (54), nonnavigable streams (55) and tide water (56).

Swamp and Overflowed lands

The ownership of subdivisions or lots affects the treatment of water boundaries.
Under the terms and provisions of the "Swamp lands Acts," the swamp and overflowed lands within their borders pass to half the public land states upon identification by public land surveys and approval of selection lists as requested (43 U.S.C., section 981 et seq.).

The "Swamp lands Acts" provide for grants to the several states to aid in reclamation of the swamp and overflowed public lands within their borders.

To bring land within the definition of the several swamp-land granting acts, the greater part of any quarter-quarter section or any lot must have been so swampy or subject to overflow during the planting, growing or harvesting season, in the majority of years at or near the date of the grant, as to be unfit for cultivation in any staple crop of the region in which it is located unless some artificial means of reclamation were provided.

Surveys covering or relating to swamp and overflowed lands require a knowledge of the provisions of the swamp-land granting acts. These acts had reference to only a specific state or two, or to the public land states in existence at the time of their passage. No state admitted after the passage of the Act of March 12, 1860 acquired any rights under these acts.

The swamp-land grants took effect in praesenti, that is, they took effect on the dates of the passage of the acts. Title to the lands, however, remained inchoate (incomplete) until the lands were identified by the public land surveys. The states then used the survey information in making lists of the lands selected as being within the swamp-land definition. These lists, when approved as required (43 U.S.C., sec. 981 et seq.), conveyed title to the states.

The states have been allowed optional methods of preparing lists of the subdivisions to be identified within the meaning of the various acts granting swamp lands.

In Alabama, Indiana, Louisiana, Michigan, Minnesota (except lands within Indian reservations), Mississippi, Ohio and Wisconsin, the swamp- land lists are based upon the survey field-note record.

In California, the swamp-land selections are based upon the representations of the survey plat.

In Florida, Illinois, Iowa, Missouri and Oregon, and within the Indian Reservations in Minnesota, the swamp-land lists are based upon investigations and reports by representatives of the state and of the Bureau of land Management. These representatives utilize survey information in preparing their reports.

The fifteen public land states which did not receive swamp and overflowed lands under the acts granting such lands are: Alaska, Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, South Dakota, Utah, Washington and Wyoming.

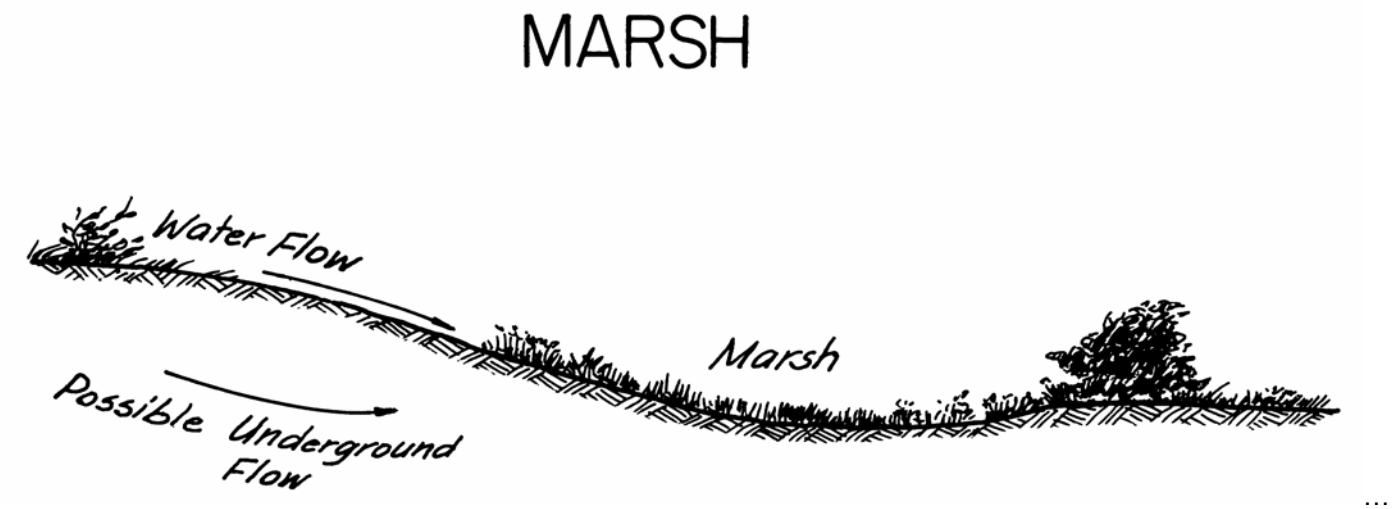
The following table shows the acts and the date of their passage. It also shows the public land states receiving grants under the terms of each act.

ACTS	STATES
Louisiana Swamp Land Act of March 2, 1849 (9 Stat. 352)	Louisiana
Swamp Lands Act of September 28, 1850 (9 Stat. 519)	Alabama * Arkansas California Florida Illinois Indiana Iowa Michigan Mississippi Missouri Ohio Wisconsin
Swamp Lands Act of March 12, 1860 (12 Stat. 3)	Minnesota Oregon

*Under the terms of the Act of April 29, 1898 (the Arkansas Swamp Lands Compromise Act), Arkansas relinquished all right, title and interest to the remaining unappropriated swamp and overflowed lands within its boundaries (43 U.S.C. sec. 987).

MARSH DESCRIPTION AND FORMATION.

A marsh is the direct result of poor drainage, evaporation and other losses combined. Marsh vegetation is composed chiefly of grasses and grass like plants. The land below a desert spring is a marsh. In BLM (Cadastral) usage, the word marsh is generally used to designate salt marshes.



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Because the swamp-land grants took effect at the date of passage of the acts, lands subject to seasonal overflow or were too wet for farming at that date were granted to the state.

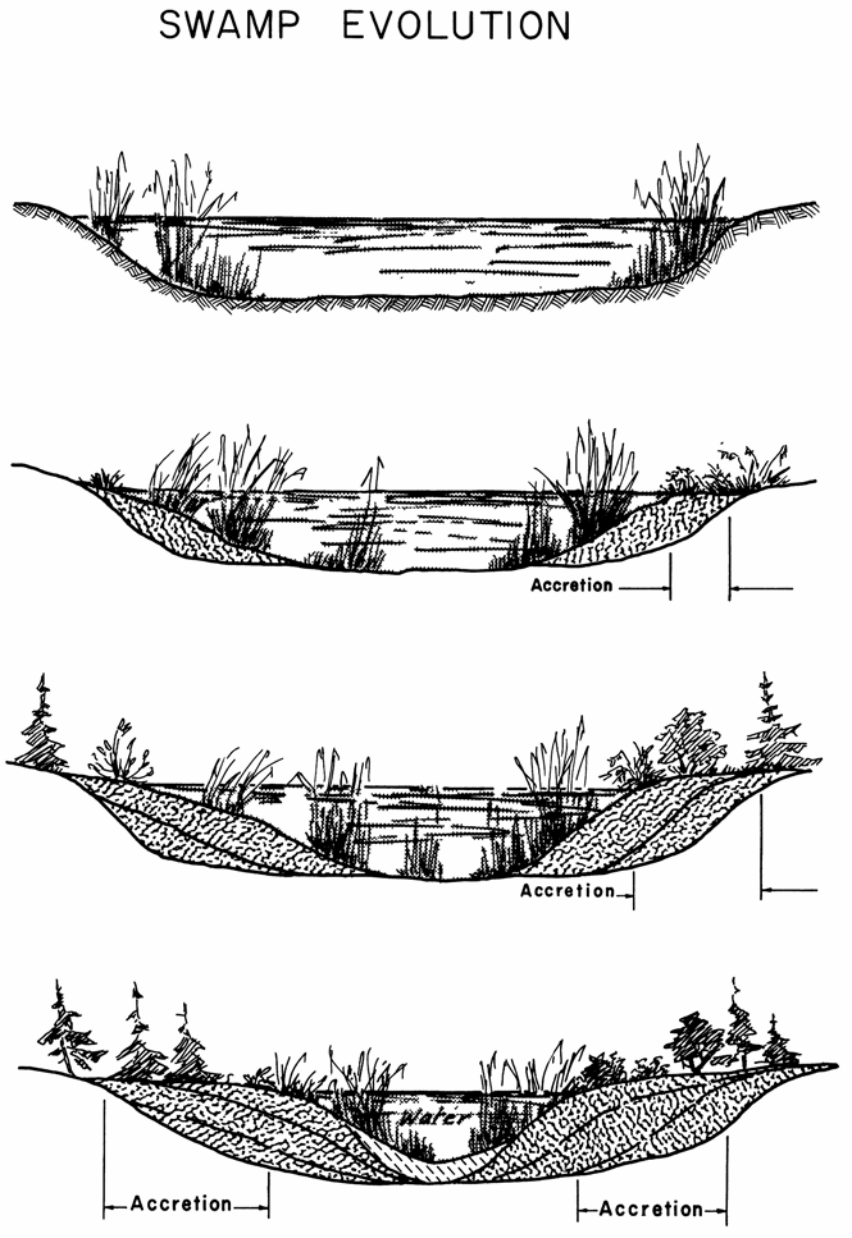
At the time of the original surveys, little or no effort was made to distinguish between different types of wetlands as swamps, marshes, or bogs. If land was not suitable for cultivation, it was called swamp, marsh, bog, or overflowed, according to the surveyor's preference. Because the surveyor was not ordinarily trained in the soil sciences, no great weight should be placed on the names applied in the original record.

The present day Cadastral Surveyor confronted with a swamp land situation is potentially faced with a more complex determination. He must determine the margin between uplands, wetlands, and (probably) open water, as those conditions existed in 1850 or 1860. Artificial drainage systems, diversion ditches, dams and pumping of ground water may have changed the character of the land from that which existed at the passage of the swamp-land act. He may need to distinguish between accretion and bog under formation.

SWAMP DESCRIPTION AND FORMATION.

Swamps do not have floating mats of vegetation which help distinguish them from bogs and muskegs. The water may be somewhat aerated such that fallen vegetation decays and falls to the bottom. Some silting normally occurs, which mixes with the vegetation falling to the bottom. As this process continues, land is formed.

The formation of land is from the bottom upward and the resulting soil is composed of inorganic as well as organic materials. The distinguishing characteristic of swamps is formation of soil from the bottom upward, sometimes with successive layers of organic, inorganic, and decay deposits.



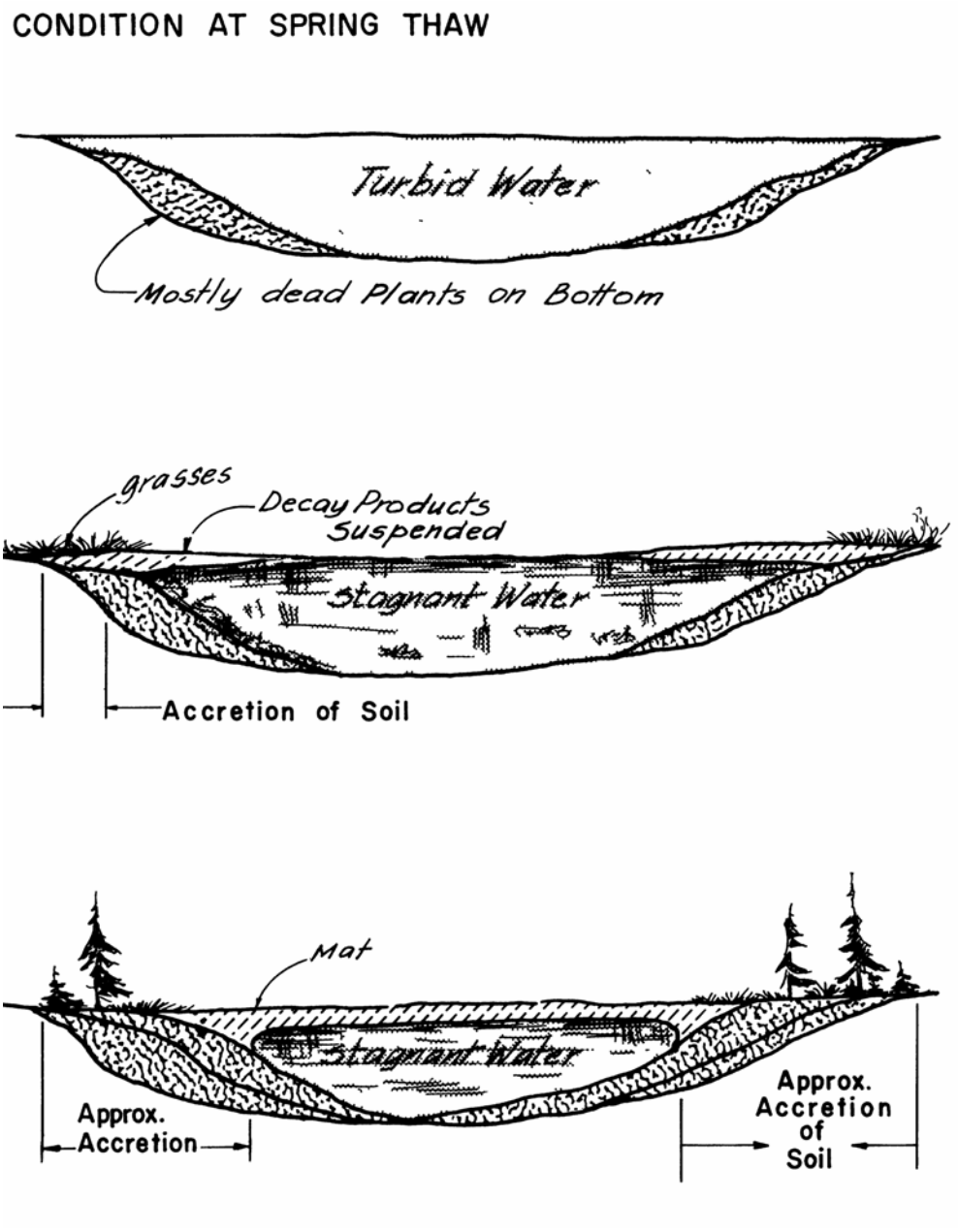
BOG DESCRIPTION AND FORMATION.

A shallow, low lying, virtually undrained body of water, where vegetation on the bottom accumulates because conditions such as temperatures, do not promote complete decay. A bog forms from a shallow pothole lake or a very slow flowing, almost stagnant stream.

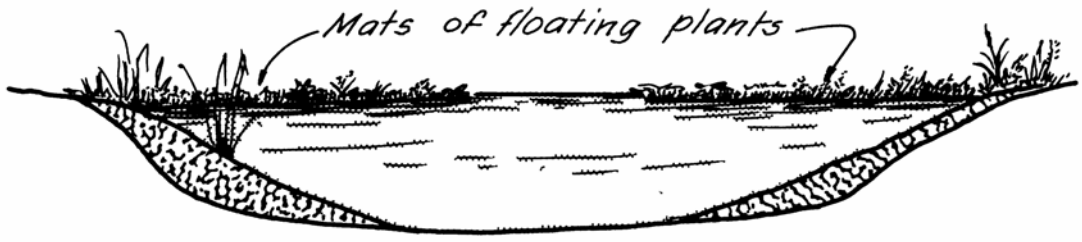
Aquatic plants begin to grow along the margins of the water. These die and begin filling in the bottom. Because of the stagnation, no silting takes place; all of the build-up is of organic material. Water lillies or water hyacinths begin to invade the surface of the water. They catch floating materials and hold them in place. The surface plants decay and new growth slowly forms a solid mat on the surface of the water. Mosses, sedges, etc., begin to take hold in the surface mat, while some decaying materials settle to the bottom. Eventually, the lake is completely covered with the boggy, matted material. In time, the whole lake will fill in with compacted, partly decayed plants and become a peat bog. The build-up of decaying plants could continue until the bog is even higher than the nearby surrounding upland. Bogs are characterized by a build-up of organic material which occurs upward from the bottom as well as out over the top of a body of stagnant water.

The precise distinction between different conditions involves determination of many factors, including acidity and oxygen content, all of which fall within the science of Limnology .

BOG EVOLUTION

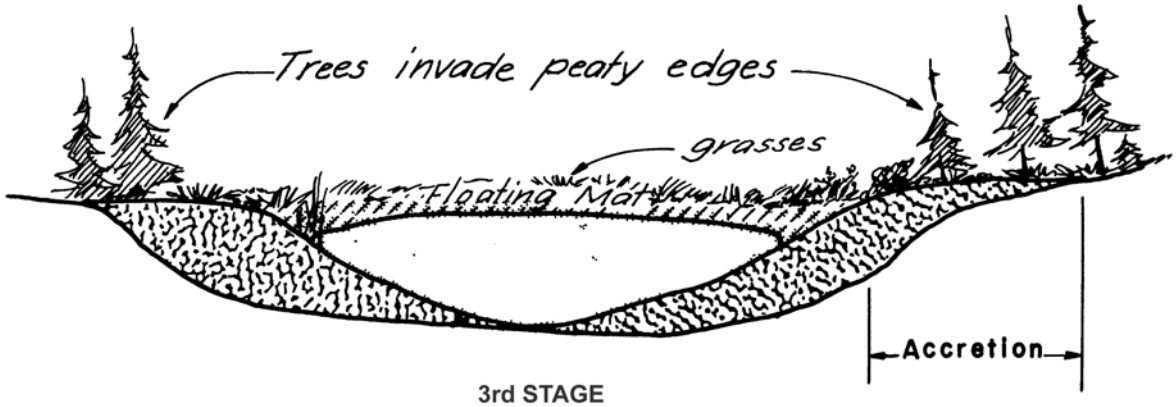


CONDITION AT LATE SUMMER



1st STAGE

2nd STAGE



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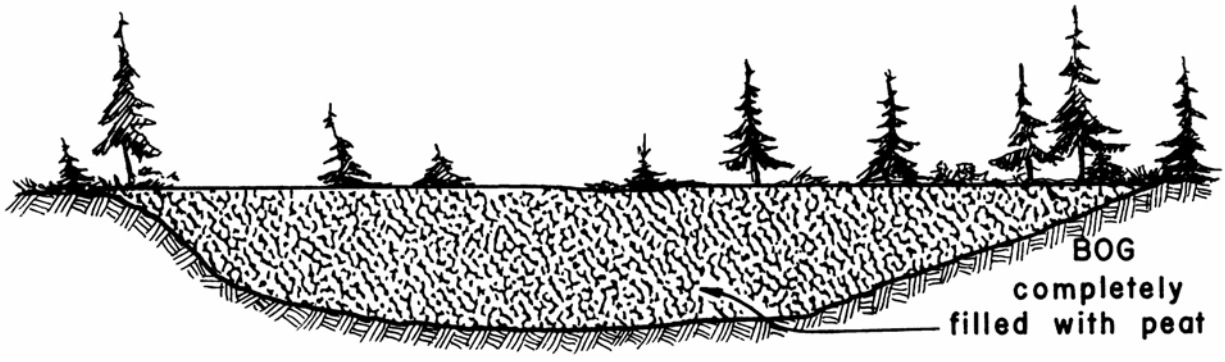

FINAL STAGE

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