



California Land Surveyors
Association

2012 LS REVIEW
Water Boundaries
March 27, 2012

2012 LS REVIEW - WATER BOUNDARIES 1

Introduction

“What are boundaries is a matter of law; where they are is a matter of fact” – Justice Wheeler, 1856

Today’s goal: to provide you with some basic tools to recognize fundamental water boundary issues that could appear on the LS exam.

2012 LS REVIEW - WATER BOUNDARIES 2

Outline

PART I - THE BASICS

PART II - TIDAL, NAVIGABLE:
Oceans; Bays; Rivers

PART III - NON TIDAL, NAVIGABLE:
Rivers; Lakes

PART IV - NON TIDAL, NON NAVIGABLE:
Streams; Ponds; Lakes

PART V - OTHER BOUNDARY SITUATIONS:
Marshlands; Swamp & Overflowed lands, Islands

PART VI - REFERENCES & OTHER USEFUL INFORMATION

2012 LS REVIEW - WATER BOUNDARIES 3

PART I – THE BASICS

2012 LS REVIEW - WATER BOUNDARIES 4

PART I – THE BASICS

Historical Discussion, important dates
1542 – California under Spanish dominion
1775 – USA born, jurisprudence adopted from English common law
1820's – California under Mexican dominion
1846-1848 – Mexican-American War
1848 – February 2, Treaty of Guadalupe Hidalgo between US & Mexico
1850 – September 9, California admitted to Union on equal footing doctrine

2012 LS REVIEW - WATER BOUNDARIES 5

PART I – THE BASICS

Case Law discussion
Much of water boundaries guidelines (and land boundaries, for that matter) come from a basic rule that is refined by court decisions

General citation format:
Smith v. Jones (2012) 1 Cal.App.5th 100, 110-115
Plaintiff v. Defendant or Appellant v. Respondent
(Date)
Volume-Reporter-Page, page(s)
Possible additional notation

2012 LS REVIEW - WATER BOUNDARIES 6

PART I – THE BASICS

Definitions – General water boundary classifications

- lacustrine – of or pertaining to lakes
- riparian – of or pertaining to rivers
- littoral – of or pertaining to oceans or the sea

2012 LS REVIEW – WATER BOUNDARIES 7

PART I – THE BASICS

Definitions – Tidal parameters

- National Tidal Datum Epoch (NTDE) – 19-year interval, currently 1983 – 2001
- Metonic cycle – 18.6 year astronomic cycle
- Diurnal – one high, one low occurring daily
- Semi-diurnal – generally two highs, two lows occurring daily, generally of equal magnitude
- Mixed – generally two highs, two lows of unequal magnitude occurring daily
- Neap – less pronounced tides occurring during 1st and 3rd quarter of the moon – quadrature
- Spring – more pronounced tides occurring during new and full moon – conjunction and opposition

2012 LS REVIEW – WATER BOUNDARIES 8

PART I – THE BASICS

Definitions – Tidal datums

- MHHW – Mean Higher High Water: average of only higher high waters over 18.6 years
- MHW – Mean High Water: average of all high waters over 18.6 years
- MTL – Mean Tide Level – median between MHW & MLW
- MSL – Mean Sea Level – average of hourly water heights over 18.6 years
- MLW – Mean Low Water – average of all low waters over 18.6 years
- MLLW – Mean Lower Low Water – average of all lower low waters over 18.6 years

2012 LS REVIEW – WATER BOUNDARIES 9

PART I – THE BASICS

Definitions – Land Forms

- Tidelands – lands covered and uncovered by the daily wash of the tides; land between MHW & MLW
- Submerged lands – lands generally covered by the daily wash of the tides; land below MLW
- Uplands – land above tidelands
- Littoral lands – land bounded by the shore of the ocean or sea
- Bight – large, curved inlet along coast
- Headlands – steep crag or cliff jutting into the sea, generally defining bay or bight
- Swamp lands – saturated, but not covered, with water, unfit for agriculture without drainage
- Overflowed lands – annually or periodically subject to natural flooding, unfit for agriculture without drainage or levees
- Marshlands – generally salt marshes, but similar in nature to swamps
- Island – body of land extending above and completely surrounded by water at ordinary high water

2012 LS REVIEW - WATER BOUNDARIES 10

PART I – THE BASICS

Definitions – Physical Characteristics

- Alluvion – flow of water against land; expansion of land due to deposition of material
- Alluvium – gravel, sand, silt, and clay sediments deposited by water due to reduced velocity
- Thread – center of main channel midway between two banks; but...also defined as that line which would provide access to owners on both sides during low water
- Thalweg – "downway"; route a boat would take downstream; route water would take at very low flow
- Median line – a line midway between banks (high or low)
- Medium filum aquae – middle thread of water

2012 LS REVIEW - WATER BOUNDARIES 11

PART I – THE BASICS

Definitions – Changes

- Natural, gradual, imperceptible – happening in a natural, gradual manner, and not perceptible
- Artificial, sudden, perceptible – due to man-made construction of effect, in a short time and recognizably different in a short time.

All of the criteria for determining the rate of change of water boundaries is HIGHLY subjective, and courts have come to different conclusions under specific cases for the same criterion.

Any discussion involving the above change criteria must be preceded by a presumption, or qualification, of what your terms mean, and the possible alternatives.

2012 LS REVIEW - WATER BOUNDARIES 12

PART I – THE BASICS

Definitions – Loss

Erosion – slow, natural and imperceptible movement of material away from a bank or shore

Avulsion – sudden and perceptible separation of bank or shore from the adjoining land mass

Submergence – the obscuring of land by raising of water or lowering of land

Construction – the removal of land from a bank or shore, by or due to artificial, man-made means

Definitions – Gain

Accretion – the slow, natural and imperceptible movement of material upon a bank or shore

Reliction – the adding of land to a bank or shore by the recession of waters

Re-emergence – the appearance of land that had previously disappeared from a bank or shore

Construction – the addition of land to a bank or shore, by or due to artificial, man-made means

2012 LS REVIEW - WATER BOUNDARIES 13

PART I – THE BASICS

Definitions – Navigability

Navigability –

[Waters] must be regarded as public navigable [waters] in law which are navigable in fact. And they are navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water. - *Bishe*

[Navigability] depends on the fact, if it be a fact, that the stream in its natural and ordinary condition affords a channel for useful commerce. - *Bohn*

Notwithstanding that navigability is another very subjective criterion of water boundaries, the threshold for navigability has been set very low as courts have applied very broad tests.

2012 LS REVIEW - WATER BOUNDARIES 14

PART I – THE BASICS

Definitions – Title

Other Sovereign Recognition –

Generally seen where there are Spanish missions (21) or Spanish Presidios (4), Pueblos (4) or Mexican Ranchos (100's) with watercourses, the original grants or patents under which title is held must be reviewed for the limitations or expansion of water boundary issues and/or public trust easement issues.

2012 LS REVIEW - WATER BOUNDARIES 15

PART I – THE BASICS

Definitions – Title

Public Trust Doctrine –
The State holds certain lands and/or rights over lands in trust for the people of the state as a result of its sovereign ownership of navigable waters.

RE: PURPOSES – The Public Trust easement is reserved to the people of the State of California for the purposes of navigation, commerce, fishing, recreation, and/or retention in its natural condition. This renders private ownership as “naked” title, or title without any concomitant practical use.

RE: TIDELANDS - ...Because the basis of the public trust easement is the original title to the tidelands on statehood, the state does not have a public trust easement over tidelands where the private title was derived from an original Mexican land grant and confirmed by a federal patent.

This extends from OHWM to OLWM, even on non-tidal, navigable waters.

Any grant from the state to private ownership is subject to the public trust easement.

Public Trust Lands –
Tidelands, whether private or public ownership; land adjacent to shoreline of non-tidal navigable waters between OHWM and OLWM.

2012 LS REVIEW - WATER BOUNDARIES 16

PART I – THE BASICS

Definitions – Metrics

Geographic mile – One minute of latitude at the equator, or approx 6,076 feet.

Nautical mile – same as geographic mile

Statute mile – 5,280 feet

League – three nautical miles at sea; three statute miles on land; 1/20 degree latitude at equator

Fathom – six feet

River mile – mileage on a river starting upstream and increasing downstream, as a boat would travel

Left Bank – the bank of a river on the left as a boat would travel

Right Bank – the bank of a river on the right as a boat would travel

World Bank – the place your money passes through as it heads for the drain

2012 LS REVIEW - WATER BOUNDARIES 17

PART I – THE BASICS

Definitions – Boundary

OHWM vs MHWL

The Ordinary High Water Mark (OHWM) or sometimes Ordinary High Tide Line (OHTL), is a term of art. It denotes a legal and title boundary of land bordered by tidal waters. It is recoverable and acquired on the ground through location of various physical characteristics, flora and possibly fauna, and has a contemporaneous character tied to the title in which it occurs.

The Mean High Water Line (MHWL) is a term of science. It is recoverable by reference to a tidal datum plane referenced to some vertical datum. It is visualized and acquired on the ground by determining the location of the intersection of a tidal datum plane with the shore of land bordered by tidal waters.

Both these lines may be coincident...or not.

ALTHOUGH BOTH THESE LINES ARE DEPENDENT ON WATER LEVELS, they denote the boundary of *land* between two separate titles.

2012 LS REVIEW - WATER BOUNDARIES 18

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

The Rules – Civil Code 670
(670.) The State is the owner of all land below tide water, and below ordinary high-water mark, bordering upon tide water within the State; of all land below the water of a navigable lake or stream; of all property lawfully appropriated by it to its own use; of all property dedicated to the State; and of all property of which there is no other owner.

2012 LS REVIEW - WATER BOUNDARIES 22

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

- The Rules – Civil Code 830
- (830.) Except where the grant under which the land is held indicates a different intent, the owner of the upland, when it borders on tide water, takes to ordinary high-water mark; when it borders upon a navigable lake or stream, where there is no tide, the owner takes to the edge of the lake or stream, at low-water mark; when it borders upon any other water, the owner takes to the middle of the lake or stream.

2012 LS REVIEW - WATER BOUNDARIES 23

PART II – TIDAL, NAVIGABLE BOUNDARIES

High seas extend seaward from a line 3 nautical miles from LWM

The marginal seas extend seaward 3 nautical miles from the LWM

Inland waters extend from the marginal seas to the OHWM

Upland owners take to the OHWM

2012 LS REVIEW - WATER BOUNDARIES 24

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

PHASES OF THE MOON

2012 LS REVIEW - WATER BOUNDARIES 28

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Neap & Spring Tides:
 Full Moon: 03.08.2012
 Last quarter: 03.14.2012
 New Moon: 03.22.2012
 First quarter: 03.30.2012

SPRING -----
 MHHW = 5.22'
 MHW = 4.93'
 MLW = 0.50'
 MLLW = 0.10'

ALL -----
 MHHW = 4.94'
 MHW = 4.44'
 MLW = 0.90'
 MLLW = 0.10'

NEAP -----
 MHHW = 4.83'
 MHW = 4.11'
 MLW = 1.18'
 MLLW = 0.14'

Part San Luis, Pacific Ocean, California

2012 LS REVIEW - WATER BOUNDARIES 29

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Unmoving Plane meets a moving landform:
 Plane of MHTL as it intersects the shoreline or bank

Ordinary: "...usual' or 'ordinary' high water mark.' By that designation we mean the limit reached by the neap tides..." – *Teschmacher*
 Ordinary: "...point at which the plane of average high tide meets the land..." – *Kent*

2012 LS REVIEW - WATER BOUNDARIES 30

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Public Trust as it pertains to other sovereign rule

If there are tidelands within an original Mexican land grant confirmed by patent, and such a public easement was not part of original confirmation, then no public trust exists.

"...We hold that California cannot at this late date assert its public trust easement over petitioner's property, when petitioner's predecessors-in-interest had their interest confirmed without any mention of such an easement in proceedings taken pursuant to the Act of 1851. The interest claimed by California is one of such substantial magnitude...this interest must have been presented in the patent proceeding or be barred. Accordingly, the judgment of the California Supreme Court is reversed..." – *Summa Corp.*

2012 LS REVIEW - WATER BOUNDARIES 34

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Shoreline changes: GAIN –

The Rules – Civil Code 1014

(1014.) Where, from natural causes, land forms by imperceptible degrees upon the bank of a river or stream, navigable or not navigable, either by accumulation of material or by the recession of the stream, such land belongs to the owner of the bank, subject to any existing right of way over the bank.

2012 LS REVIEW - WATER BOUNDARIES 35

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Shoreline changes: GAIN

Rules of Engagement

- The general rule is gradual and imperceptible incurs gain or loss
- 1. accretion, natural: the gradual and imperceptible deposition of material to the bank or shore
 - a) land so formed is added to that of the owner of the bank.
 - b) title to riparian land passes title to accreted land unless contrary intent is indicated
 - c) Federal law provides for accretions to be owned along navigable shore, ...but....
 - d) California cases have provided for state ownership if a substantial time elapses between original survey and entry (unjust enrichment of landowner).

2012 LS REVIEW - WATER BOUNDARIES 36

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Shoreline changes: GAIN

2. accretion, artificial: deposition of land due to works of man

a) California does NOT recognize general rule of accretion for beds of waters below OHWM or OLWM.

b) Artificially created land next to tidal waters is belongs to the state, the owner of the underlying bed.

c) Public trust ownership of the bed cannot alienate the trust easement from trust lands,but....

d) distance may matter. Public Trust Doctrine permits loss of public trust property by natural accretion, but not by artificial accretion. If, as in a 1995 case, the artificial means of accretion or erosion are sufficiently distant, that may render the erosion or accretion "natural" and so may deprive the state of the accreted lands.

3. reliction: the exposure of land by gradual receding of water

a) land so "formed" is added to that of the riparian or littoral owner

2012 LS REVIEW - WATER BOUNDARIES 37

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Shoreline changes: LOSS –

Rules of Engagement

the general rule is gradual and imperceptible incurs gain or loss

1. erosion, natural: the gradual and imperceptible removal of material from the bank or shore

a) riparian or littoral owner loses land

b). title to riparian or littoral land passes exposure to erosion of land unless contrary intent is indicated

2. erosion, artificial: the removal of land due to works of man

a) will not change water boundaries, but the boundary remains in the last natural location

3. submergence: the gradual and imperceptible loss of land through rising of waters (the reverse of reliction)

a) boundary changes with change in water line; loss of land to riparian or lacustrine owner (not littoral?)

2012 LS REVIEW - WATER BOUNDARIES 38

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

The diagram illustrates shoreline changes. On the left, the 'Pacific Ocean' is labeled. A 'Natural Shoreline' is shown as a dashed line. To its right is 'Upland'. 'Littoral Drift' is indicated by arrows pointing towards the shore. 'artificial accretions' and a 'rock groin' are shown as structures extending into the water, creating a 'New Shoreline' that is further inland than the natural one. 'erosion' is shown as a gap between the natural and new shorelines.

Shoreline changes: LOSS and GAIN

2012 LS REVIEW - WATER BOUNDARIES 39

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Shoreline changes: LOSS OR GAIN BY AVULSION-

The Rules – Civil Code 1015

(1015) If a river or stream, navigable or not navigable, carries away, by sudden violence a considerable and distinguishable part of a bank, and bears it to the opposite bank, or to another part of the same bank, the owner of the part carried away may reclaim it within a year after the owner of the land to which it has been united takes possession thereof.

2012 LS REVIEW - WATER BOUNDARIES 40

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

Shoreline changes: LOSS OR GAIN BY AVULSION

Rules of Engagement

- The general rule is sudden and perceptible do NOT incur gain or loss
- 1. avulsion: the sudden removal of land from a bank or shore by force or change and *attachment to another*; tearing away, separation
 - a) avulsion will not cause loss of land from riparian or littoral owner
 - b) the "avulsed" owner can recover land so separated within year
-Jane does not loose her property now bisected by new channel
- 2. the change in direction or location of water moves riparian banks or shore away from former riparian or littoral owner and that owner ceases to be a riparian owner
-Joe is no longer has riparian property!

2012 LS REVIEW - WATER BOUNDARIES 41

PART II – TIDAL, NAVIGABLE WATER BOUNDARIES

PROPERTY BOUNDARIES REMAIN AS THEY WERE PRIOR TO THE AVULSIVE CUT

OWNERSHIP REMAINS IN THE HISTORIC CHANNEL

Joe's Property

Jane's Property

NEW CHANNEL

OLD CHANNEL

NEW PROPERTY

Shoreline changes: LOSS OR GAIN BY AVULSION

2012 LS REVIEW - WATER BOUNDARIES 42

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

What you want to know...the general rule is:

- The Rules – Civil Code 830
- **(830.)** Except where the grant under which the land is held indicates a different intent, the owner of the upland, when it borders on tide water, takes to ordinary high-water mark; when it borders upon a navigable lake or stream, where there is no tide, the owner takes to the edge of the lake or stream, at low-water mark; when it borders upon any other water, the owner takes to the middle of the lake or stream.

2012 LS REVIEW - WATER BOUNDARIES 46

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

- The Rules – Code of Civil Procedure 2077
- **2077.** Section Two Thousand and Seventy-seven. The following are the rules for construing the descriptive part of a conveyance of real property, when the construction is doubtful and there are no other sufficient circumstances to determine it:
 - One--Where there are certain definite and ascertained particulars in the description, the addition of others which are indefinite, unknown, or false, does not frustrate the conveyance, but it is to be construed by the first mentioned particulars.
 - Two--When permanent and visible or ascertained boundaries or monuments are inconsistent with the measurement, either of lines, angles, or surfaces, the boundaries or monuments are paramount.
 - Three--Between different measurements which are inconsistent with each other, that of angles is paramount to that of surfaces, and that of lines paramount to both.
 - Four--When a road, or stream of water not navigable, is the boundary, the rights of the grantor to the middle of the road or the thread of the stream are included in the conveyance, except where the road or thread of the stream is held under another title.
 - Five--When tide water is the boundary, the rights of the grantor to ordinary high-water mark are included in the conveyance. When a navigable lake, where there is no tide, is the boundary, the rights of the grantor to low-water mark are included in the conveyance.
 - Six--When the description refers to a map, and that reference is inconsistent with other particulars, it controls them if it appears that the parties acted with reference to the map; otherwise the map is subordinate to other definite and ascertained particulars.

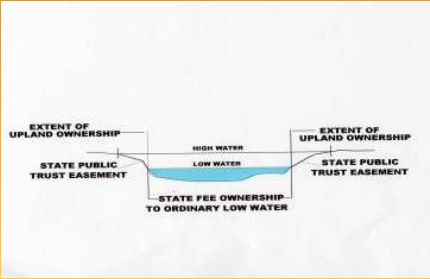
2012 LS REVIEW - WATER BOUNDARIES 47

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

The boundary between the state and upland owners of nontidal, navigable rivers and lakes is Mean Low Water Mark (MLWM)
 The State owns bed from LWM.
 Even if a meander line present, ownership still extends to LWM
 The area between HWM and LWM is "shorezone", possibly subject to public trust.

2012 LS REVIEW - WATER BOUNDARIES 48

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES



OHWM – OLWM – Public Trust Easement

2012 LS REVIEW - WATER BOUNDARIES 49

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

Location of Low Water Mark:
Will be based on mean or average or "ordinary" low water level
Does not need to be the historic low point
Does not take into account seasonal fluctuations

2012 LS REVIEW - WATER BOUNDARIES 50

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

RE: NAVIGABILITY
You need to determination *when* water is navigable or non-navigable
Title depends on condition of navigability on September 9, 1850
•if navigable, boundary is LWM
•if non-navigable, title to the bed was not transferred to State and remained vested in United States and would be transferred with federal patent
•if non-navigable, boundary is "middle" (remember CC 830)

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

Test for NAVIGABILITY: Navigability at law is navigability in fact.
Conditions for navigability:

- The water need to be “susceptible to navigation”
- Navigability need not be continuous
- Navigability need not be in extraordinary or high water levels, but in “ordinary” condition
- Navigability need not be easy (...nothing ever is....) but can be made in spite of obstructions

2012 LS REVIEW - WATER BOUNDARIES 52

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

RE: Meanders –

- Conveyance along bank of navigable river
- Meanders along tidal rivers do not affect actual boundary, OLWM is still boundary
- There still is or may be a public trust easement between OHWM and OLWM!

2012 LS REVIEW - WATER BOUNDARIES 53

PART III – NONTIDAL, NAVIGABLE WATER BOUNDARIES

RE: Other Sovereign Recognition –

- The rules for Spanish or Mexican grants are the same as for tidal, navigable waters

RE: Shoreline Changes

- The rules for Gain or Loss by natural and artificial means are generally the same as for tidal, navigable waters

2012 LS REVIEW - WATER BOUNDARIES 54

PART IV – NONTIDAL, NON-NAVIGABLE WATER BOUNDARIES

What you want to know...the general rule is:

- The Rules – Civil Code 830
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PART IV – NONTIDAL, NON-NAVIGABLE WATER BOUNDARIES

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PART IV – NONTIDAL, NON-NAVIGABLE WATER BOUNDARIES

- Property adjacent to NON TIDAL, NON-NAVIGABLE waters:
 - Ownership to center
 - Center is midway or median
 - There may be a different intent expressed in the instrument of title for the boundary or limit of the land conveyed
 - If title indicates the shore, the boundary is the OLWM
 - There may be access issues if the title does not extend to the middle of the stream
 - If title indicates the general term of "river", without an express intent, title carries to the thread

END
PART IV – NONTIDAL, NON-NAVIGABLE WATER BOUNDARIES

2012 LS REVIEW - WATER
BOUNDARIES 61

PART V – OTHER WATER BOUNDARIES
ISLANDS, SWAMP & OVERFLOWED LANDS

2012 LS REVIEW - WATER
BOUNDARIES 62

PART V – OTHER WATER BOUNDARIES –
ISLANDS

What you want to know...the general rule is:

The Rules – Civil Code 830

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2012 LS REVIEW - WATER
BOUNDARIES 63

PART V – OTHER WATER BOUNDARIES –
ISLANDS

What you want to know....the general rules are:

The Rules – Civil Codes 1016-1018

- **(1016)** Islands and accumulations of land, formed in the beds of streams which are navigable, belong to the State, if there is no title or prescription to the contrary.
- **(1017)** An island, or an accumulation of land, formed in a stream which is not navigable, belongs to the owner of the shore on that side where the island or accumulation is formed; or, if not formed on one side only, to the owners of the shore on the two sides, divided by an imaginary line drawn through the middle of the river.
- **(1018)** If a stream, navigable or not navigable, in forming itself a new arm, divides itself and surrounds land belonging to the owner of the shore, and thereby forms an island, the island belongs to such owner.

2012 LS REVIEW - WATER BOUNDARIES 64

PART V – OTHER WATER BOUNDARIES –
ISLANDS

Nature of title for islands is time-dependent.

- An island present **BEFORE** statehood (09.09.1850)
 - In a meanderable water **and surveyed...**
 - Had to be surveyed – if the island was meanderable or not - and shown on GLO plat
 - Had to have ties to upstream and downstream points if not meanderable
 - Belongs to federal government available for patent
 - In a meanderable water **and NOT surveyed**, (even if US parted with title to land adjoining mainland)...
 - Is considered NOT in bed at statehood
 - Remains federal land and is subject to survey
 - Is subject to disposal by US when identified

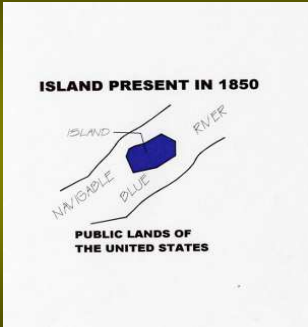
2012 LS REVIEW - WATER BOUNDARIES 65

PART V – OTHER WATER BOUNDARIES –
ISLANDS

- What is "meanderable"?
 - Navigable rivers along OHWM
 - Non-navigable rivers and streams when 3 chains or wider
 - Navigable lakes at OHWM
 - Non-navigable lakes of 50 acres and greater, if authorized
 - Islands above OHWM or MHT
 - Swamp & Overflowed lands at line of OHWM or OHT – NOT at segregation line
- What is "a meander"?
 - It is a traverse that approximates the margin of a permanent natural body of water
 - It is for delineation and purposes of computing area
 - It is NOT meant to be OHWM or OHT for boundary purposes

2012 LS REVIEW - WATER BOUNDARIES 66

PART V – OTHER WATER BOUNDARIES – ISLANDS



ISLAND PRESENT IN 1850

ISLAND RIVER

NAVIGABLE BLUE

PUBLIC LANDS OF THE UNITED STATES

2012 LS REVIEW - WATER BOUNDARIES 67

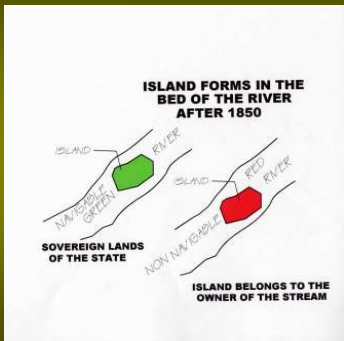
PART V – OTHER WATER BOUNDARIES – ISLANDS

Nature of title for islands is time-dependent.

- An island that emerges **AFTER** statehood (09.09.1850)
 - In a navigable body of water due to accretion
 - Is considered part of the bed and thus ownership vested in the state
 - In a non-navigable body of water due to accretion
 - If on one side or the other of the center will be owned by the owner of that bank
 - If straddles the center is owned by both owners of opposite banks

2012 LS REVIEW - WATER BOUNDARIES 68

PART V – OTHER WATER BOUNDARIES – ISLANDS



ISLAND FORMS IN THE BED OF THE RIVER AFTER 1850

ISLAND RIVER

NAVIGABLE GREEN

SOVEREIGN LANDS OF THE STATE

NON NAVIGABLE RED RIVER

ISLAND BELONGS TO THE OWNER OF THE STREAM

2012 LS REVIEW - WATER BOUNDARIES 69



