

# Goodbye to the River: A Summary

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Austin Water Center for Environmental Research at Hornsby Bend



## Goodbye to a River

A NARRATIVE



"John Graves' writing is irresistible... The reader who misses him will have missed much."  
—Larry McMurtry

JOHN GRAVES

Illustrations by Russell Waterhouse



# Center for Environmental Research at Hornsby Bend



## The Geography of Rivers: Morphology, Ecology, and Culture

The 2013 Lunchtime Lectures will explore the geography of rivers.

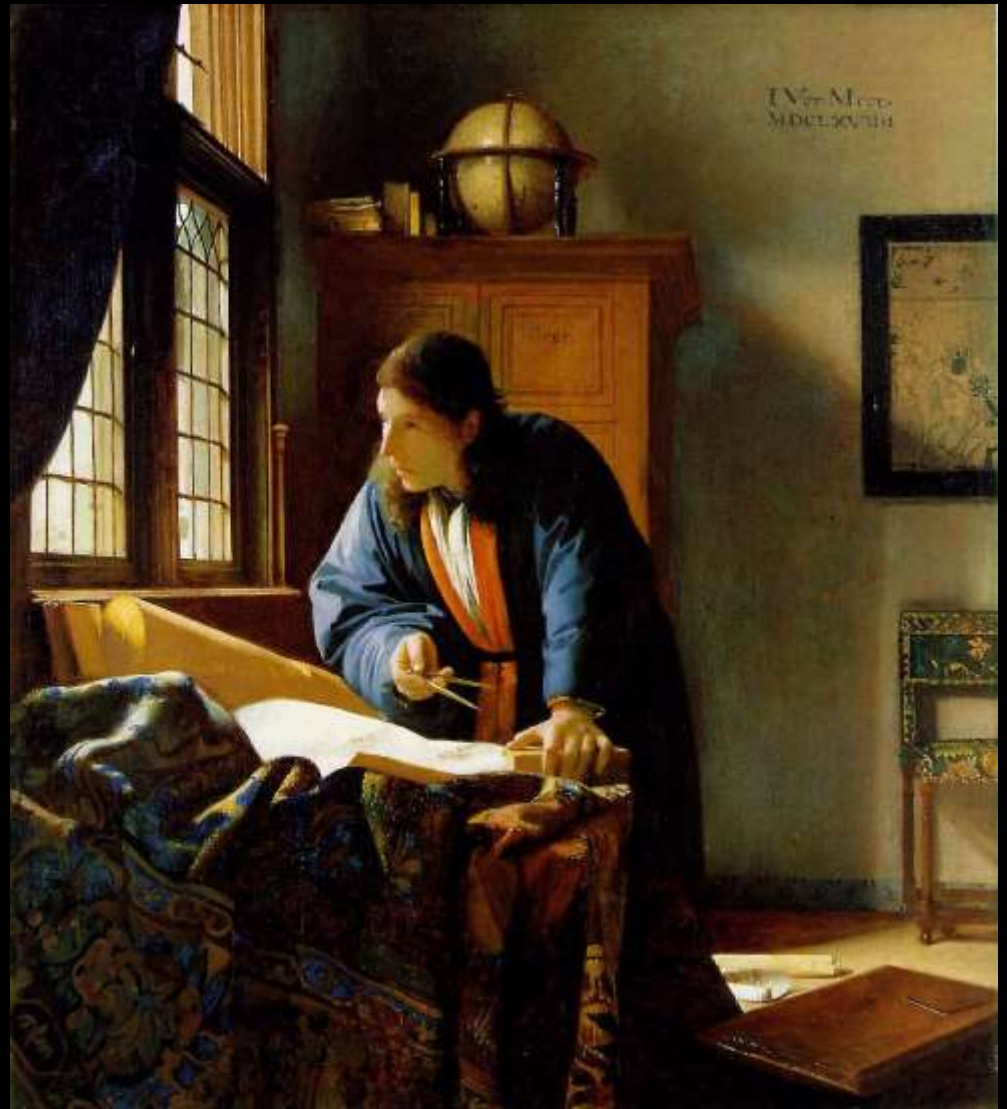


# Geography

A literal translation would be "to describe or write about the Earth".

As the bridge between the human and physical sciences, geography is divided into two main branches – human/cultural geography and physical geography.

Vermeer "The Geographer"  
1668–1669



What is needed is a gentler basis for perceiving the effects of our engineering capabilities. This more humble view of our relation to the hydrologic system requires a modicum of reverence for rivers.

Luna Leopold

October 8, 1915 – 2006

“A Reverence for Rivers”



## The Culture of Rivers – January to April

Humans have ancient and complex cultural relationships to rivers revealing the deep significance rivers have for the human psyche. The river as a symbol of Being can be found throughout mythology, and, from the Pre-Socratic philosopher Heraclitus, we supposedly learned that one cannot step in the same river twice. Moreover, the visual arts, music, and literature of rivers reveal the rich imaginative engagement of human culture with the meaning of rivers.

January 9 at Dougherty Arts Center – The Round River: Myth, Meaning, and Rivers

January 30 at City Hall - The Round River: Myth, Meaning, and Rivers

February 13 at Dougherty Arts Center – Riverrun: Language, Art, and Rivers

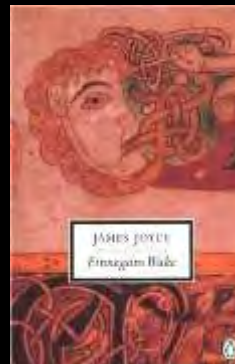
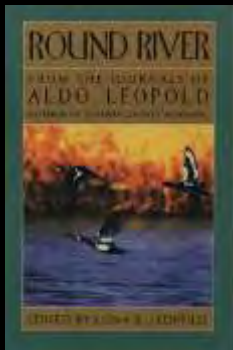
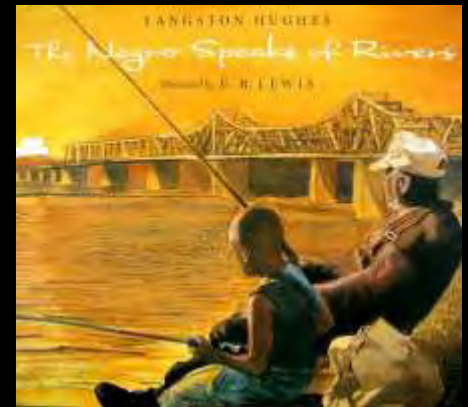
February 20 at City Hall – Riverrun: Language, Art, and Rivers

March 13 at Dougherty Arts Center – Riversong: American Rivers and Music

March 20 at City Hall – Riversong: American Rivers and Music

April 10 at Dougherty Arts Center – Strong Brown God: the Poetry of Rivers

April 17 at City Hall – Strong Brown God: the Poetry of Rivers



## River Systems – May to August

Rivers write their way across the surface of the Earth, inscribing deeply or shallowly depending on how resistant the surface is to the flow of water and sediment carried by the river. This morphology of the physical geography of the Earth is the starting point for geography, but a geographer must go beyond the physical shapes and shaping of rivers in order to fully understand them. The living river begins with the geochemistry of flowing water which merges with the biochemistry of aquatic organisms and then further merges with the terrestrial ecology of organisms living along the river's riparian and bottomland zones.

May 8 at Dougherty Arts Center – River Process: the Fluvial System and River Hydrology

May 15 at City Hall - River Process: the Fluvial System and River Hydrology

June 12 at Dougherty Arts Center – River Life: the Ecology of Flowing Water

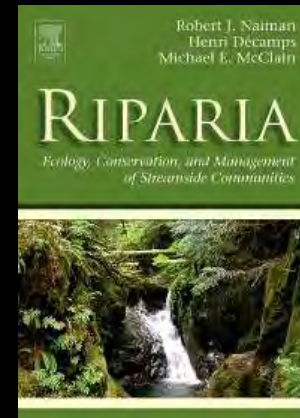
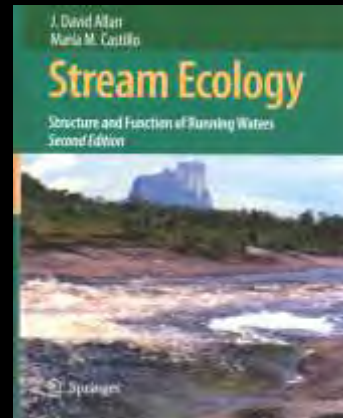
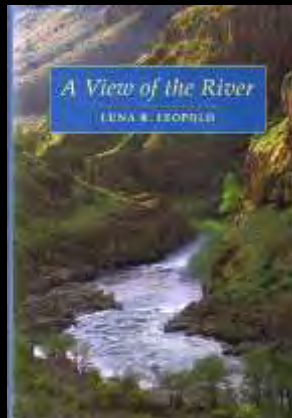
June 19 at City Hall - River Life: the Ecology of Flowing Water

July 10 at Dougherty Arts Center – Riparia: Life at the River's Edge

July 17 at City Hall - Riparia: Life at the River's Edge

August 14 at Dougherty Arts Center – Bottomland: Floodplain Habitats

August 21 at City Hall - Bottomland: Floodplain Habitats



# Rivers of Culture – September to December

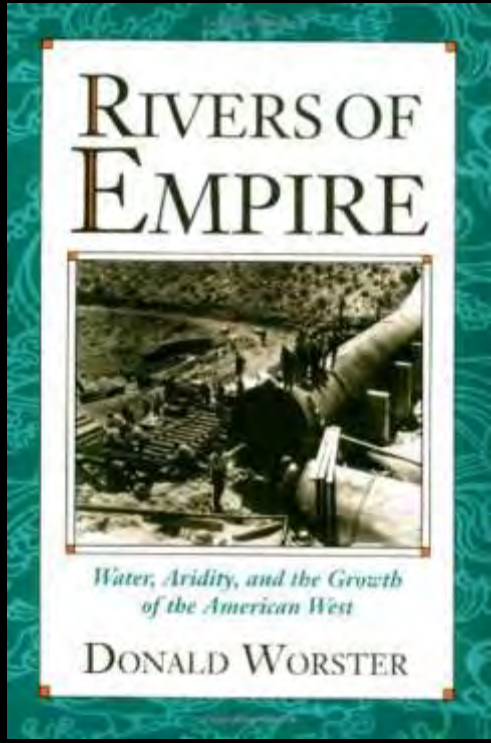
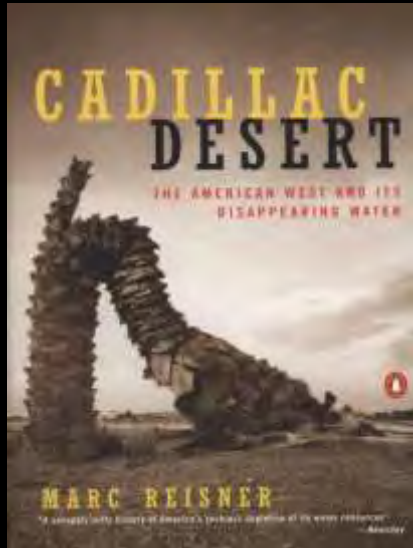
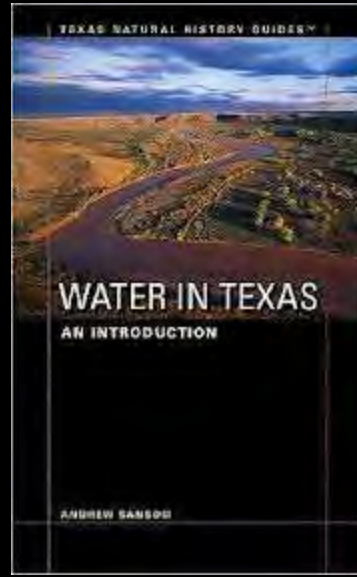
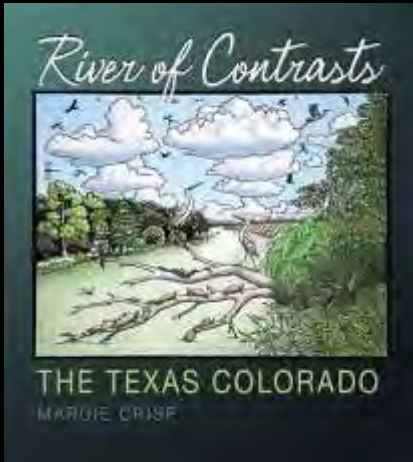
The keystone organisms that impact all aspects of river systems are humans, who settle along rivers and transform hydrology and ecology as we turn natural landscapes into cultural landscapes.

September 11 at Dougherty Arts Center – Rivers of Empire: American Rivers  
September 18 at City Hall - Rivers of Empire: American Rivers

October 9 at Dougherty Arts Center – Waters the Land: Texas Rivers  
October 16 at City Hall - Waters the Land: Texas Rivers

November 13 at Dougherty Arts Center – Another Colorado: Rivertown Austin  
November 20 at City Hall - Another Colorado: Rivertown Austin

December 11 at Dougherty Arts Center – Goodbye to the River: A Summary  
December 18 at City Hall - Goodbye to the River: A Summary



## River Language

### A Linguistic Journey



Riverside	Aquifer	Downstream
Riparian	Floodplain	Upstream
Riverine	Erosion	Midstream
Bottomland	Aggrading	Fork
Shoal	Degrading	Hydraulic
Eddy	Downcutting	Terrace
Whirlpool	Reach	Flume
Bar	Channel	Gradient
Rapid	Drainage	Slope
Bank	Watershed	Gravel
Bed	Catchment	Gully
Riffle	Basin	Hydrological
Ripple	Sediment	Hyporheic
Bend	Branch	Thalweg
Pool	Stream	Sweep
Hole	Current	Sinuuous
Bankfull	Surface	Tributary
Snag	Submerge	Inflow
Backwater	Depth	Outflow
Alluvial	Sounding	Headwaters
Fan	Groundwater	Mouth
Braid	Surfacewater	Delta
Oxbow	Discharge	Estuary
Meander	Peak Flow	Flood

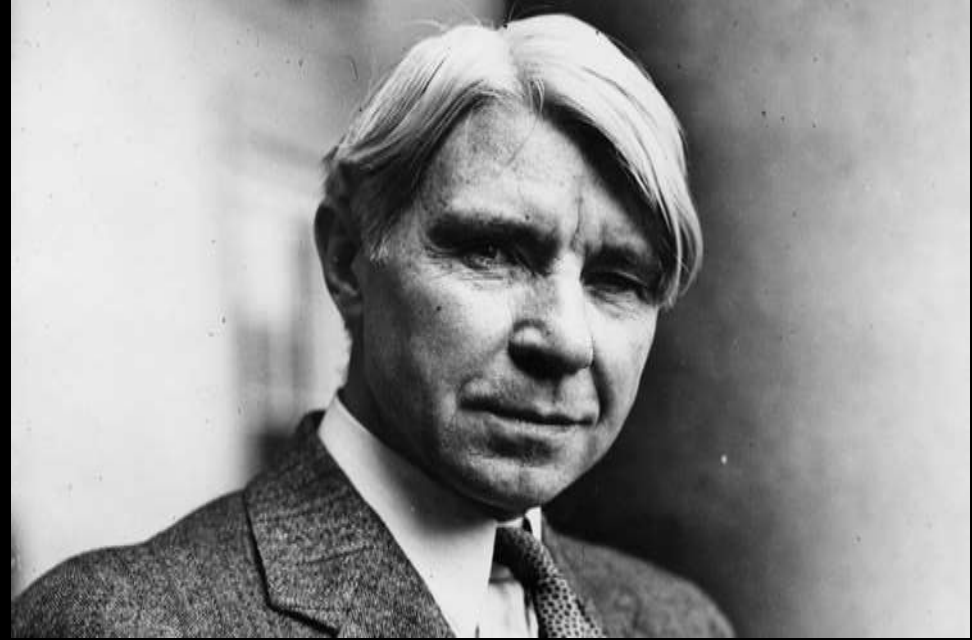


Carl Sandburg

1878–1967

## Languages

There are no handles upon a language  
Whereby men take hold of it  
And mark it with signs for its remembrance.  
It is a river, this language,  
Once in a thousand years  
Breaking a new course  
Changing its way to the ocean.  
It is mountain effluvia  
Moving to valleys  
And from nation to nation  
Crossing borders and mixing.  
Languages die like rivers.  
Words wrapped round your tongue today  
And broken to shape of thought  
Between your teeth and lips speaking  
Now and today  
Shall be faded hieroglyphics  
Ten thousand years from now.  
Sing—and singing—remember  
Your song dies and changes  
And is not here to-morrow  
Any more than the wind  
Blowing ten thousand years ago.



*Goodbye to a River*  
(1960)

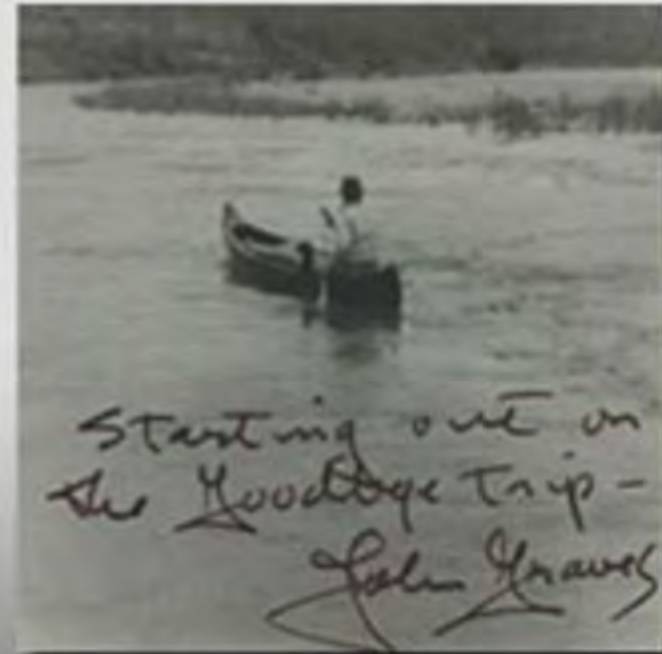
Goodbye  
to a River

• NARRATIVE



JOHN GRAVES

Illustrations by Russell Waterhouse



“One river, seen right, may well be all rivers that flow to the sea...”

John Graves 1920-2013

Born August 6, 1920 in Fort Worth, Texas, John Alexander Graves III grew up in that city until moving away to attend college in 1938.

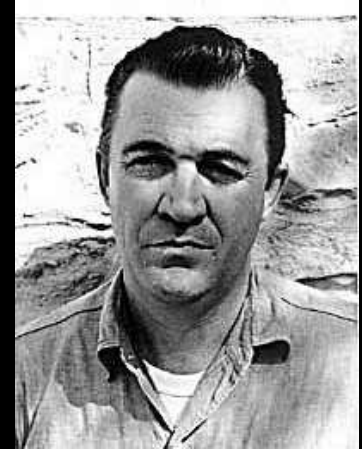
He graduated from Rice Institute (now Rice University) with a B.A. in English in 1942, then entered the Marine Corps and served in the Pacific theater until being wounded by a Japanese grenade on the island of Saipan.

After the service, Graves traveled to Mexico for a few months then attended Columbia University, earning an M.A. in English from there in 1948.

Graves taught English from 1948 to 1950 at The University of Texas at Austin, but left academia and Texas behind to spend a year freelance writing in New York City.

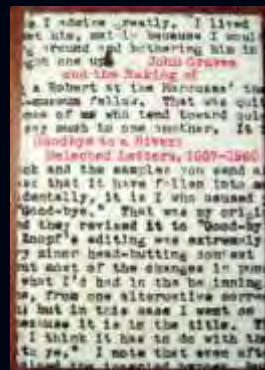
From January 1953 to July 1955 he spent abroad, living mostly in Spain, including the Canary Islands for some months on a resident colony of writers and artists.

In the spring of 1957 Graves returned home to help care for his gravely ill father. In November of that year, Graves completed a three-week canoe trip down part of the Brazos River that he feared was about to be changed forever by dams.

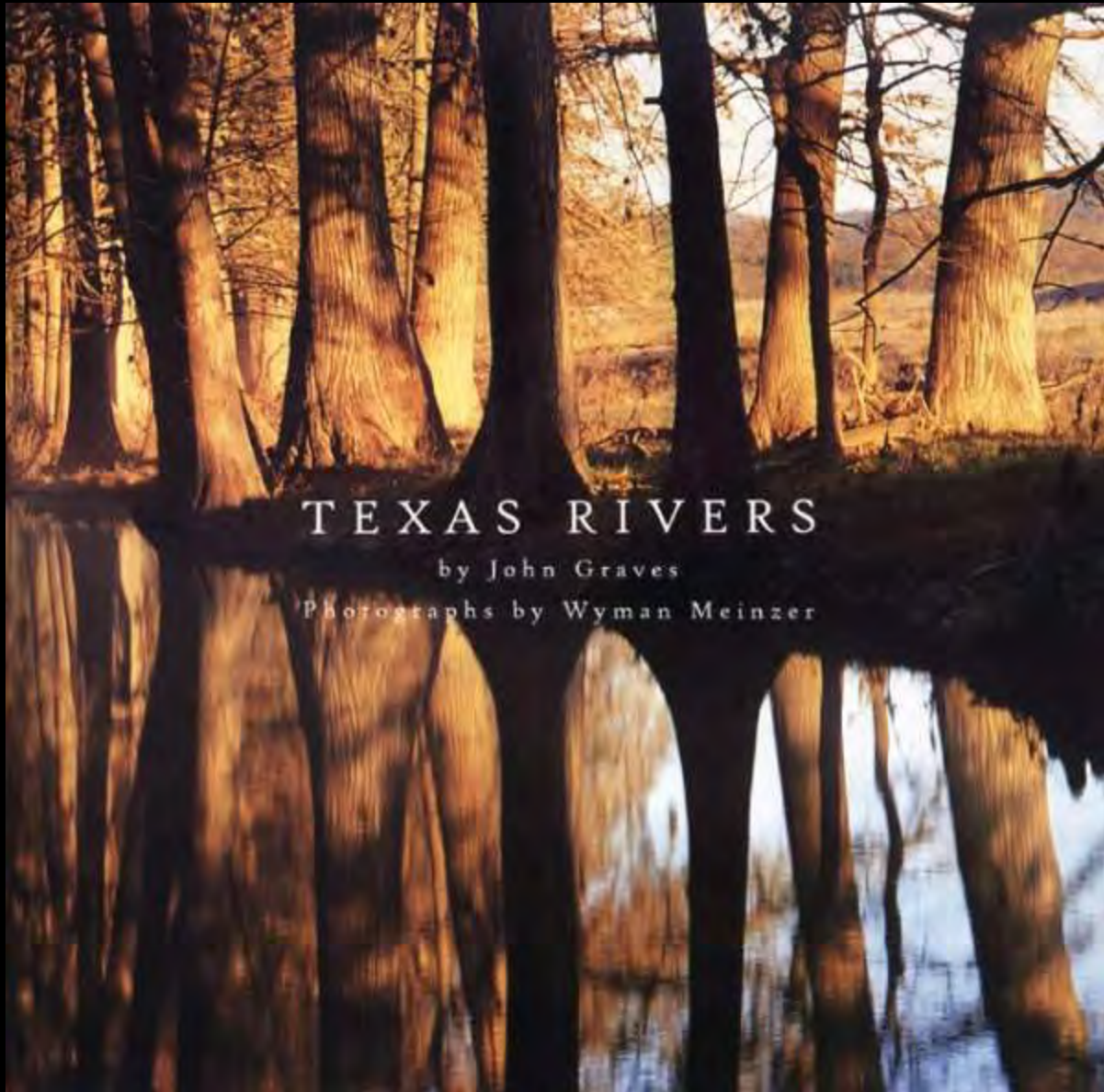


## The Legacy - books by John Graves

- *Hard Scrabble* [1974]
- *From a Limestone Ledge* [1980]
- *Self Portrait, with Birds: Some Semi-Ornithological Recollections* (1991)
- *A John Graves Reader* [1996]
- *John Graves and the Making of Goodbye to a River: Selected Letters, 1957-1960* [2002]
- *Myself and Strangers* [2004]
- *My Dogs and Guns* [2007]



2002



TEXAS RIVERS

by John Graves

Photographs by Wyman Meinzer

What kind of book?

Nature Writing, History, Ethnography, Fiction?

Cultural Geography?

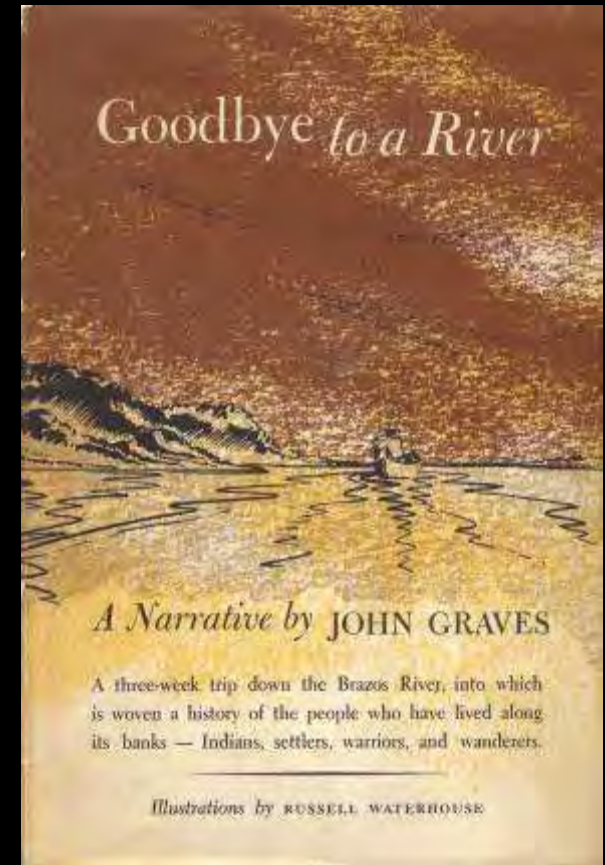
“a mistiness to the telling”

“A Narrative by John Graves”

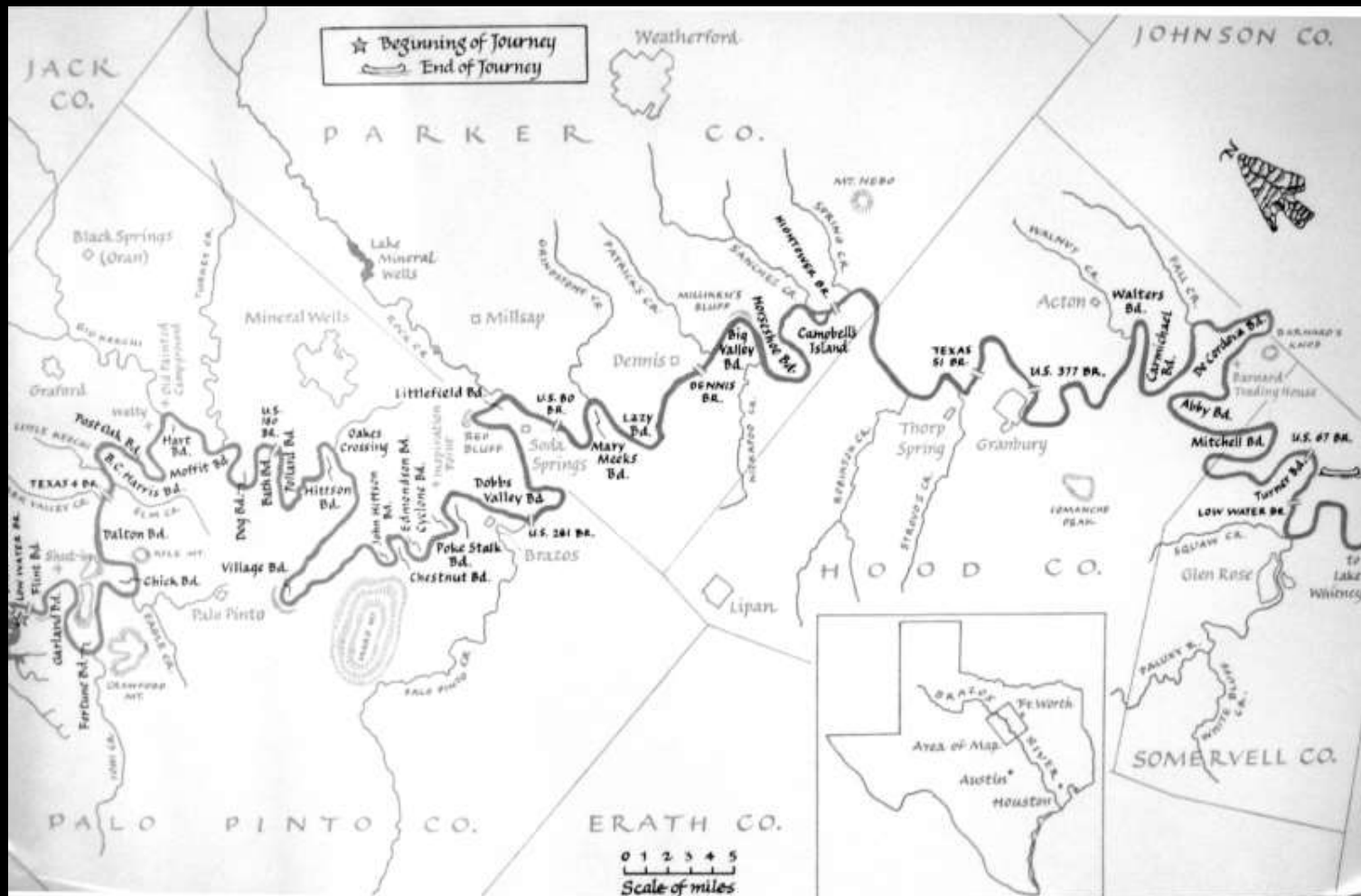
A travel tale...

A Quest for self-understanding

(“Saint Henry” – on the Concord River)



# A three week 175-mile journey down the Brazos River in November 1957

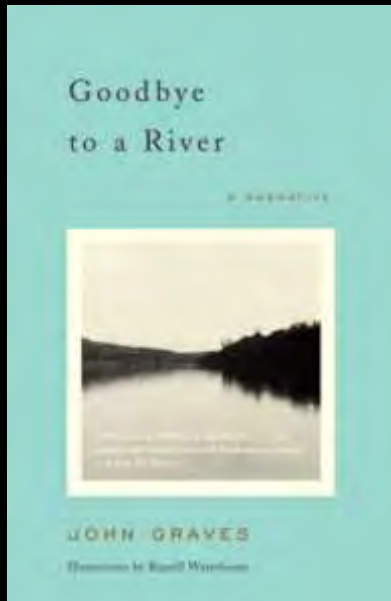


## The Real Whole River

Can we know a river? What is it to “know” a river? [a philosopher/geographer’s question]

A whole river is mountain country and hill country and flat country and swamp and delta country, is rock bottom and sand bottom and weed bottom and mud bottom, is blue, green, red, clear, brown, wide, narrow, fast, slow, clean, and filthy water, is all kinds of trees and grasses and all the breeds of animals and birds and men that pertain and have ever pertained to its changing shores, is a thousand differing and not compatible things in-between that point where enough of the highland drainlets have trickled together to form it, and the wide, flat, probably desolate place where it discharges itself into the salt of the sea.

It is also an entity, one of the real wholes, but to feel the whole is hard because to know it is harder still. 4





## The Sage of Glen Rose – Characteristics of Graves Style

- Considering rather than Concluding – “mulling over”
- Self Understanding and Doubt
- Complexity of Context
- Shadowed writing
- Plaintive



In recent decades it has become customary, and right I guess, and easy enough with hindsight, to damn the ancestral frame of mind that ravaged the world so fully and so soon. What I myself seem to damn mainly though, is just not having seen it. Without any virtuous hindsight I would likely have helped in the ravaging as did even most of those who loved it best.

But God! To have viewed it entire, the soul and guts of what we had and gone forever now, except in books and such poignant remnants as small swift birds that journey to and from the distant Argentine, and call at night in the sky.

- From *Self Portrait, with Birds: Some Semi-Ornithological Recollections* (1991)

## Quest for self understanding - His People – His Texas

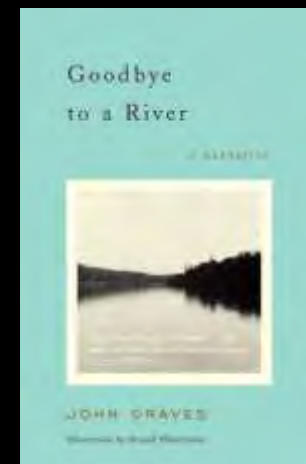
Mankind is one thing; a man's self is another. What that self is tangles itself knottily with what his people were, and what they came out of. Mine came out of Texas, as did I.

If those were louts, they were my own louts. 144

They were the cutting edge of a people whetted sharp to go places, to wear things out and move on, to take over and to use and to discard. 48

The hills are not rich country, not since the old ones cottoned out the flat places and grazed out the slopes, and the topsoil went on down the Brazos, and the cedar moved in thick and sullen, letting nothing grow beneath it. That happened so long ago that a whole, spare, organic way of life has had time to grow up around the cedar itself, and even in the thirties only a few ancients recollected scraps of the brief richer time. 86

Calvinistic fundamentalism and its joined opposite, violent wallowing sin, settled that part of the world, and have flourished there since like bacteria in the yolk of an egg. 178



# A Shadowed Book

## Shadow of violence and war

- The People – Comanches and the blood soaked Texas 19<sup>th</sup> Century frontier
- His ancestral kin – Anglo settlers – my own louts – and their violence
- World War II



## Shadowed Inheritance

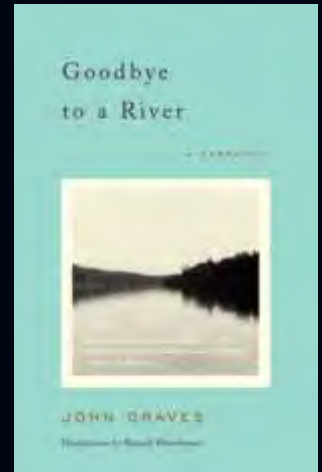
Neither a land nor a people ever starts over clean.

Country is compact of all its past disasters and strokes of luck—of flood and drouth, of the caprices of glaciers and sea winds, of misuse and disuse and greed and ignorance and wisdom—and though you may doze away the cedar and coax back bluestem and mesquite grass and side-oats grama, you're not going to manhandle it into anything entirely new.

It's limited by what it has been, by what's happened to it. And a people, until that time when it's uprooted and scattered and so mixed with other peoples that it has in fact perished, is much the same in this as land.

It inherits.

237



## Shadowed by pessimism about the future of the land

One waxes pessimistic? Not so much...

There is a pessimism about land which, after it has been with you a long time, become merely factual. Men increase; country suffers. Though I sign up with organizations that oppose the process, I sign without great hope...

Islands of wildlife and native flora may be saved, as they should be, but the big, sloppy, rich, teeming spraddle will go. It always has. 58



A three week trip down the Brazos River in November 1957



113-mile segment of the Brazos River between Possum Kingdom Lake and Lake Granbury

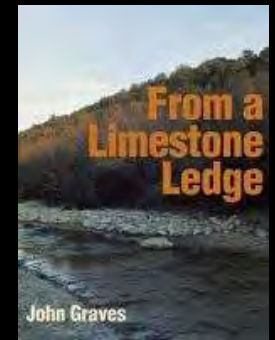
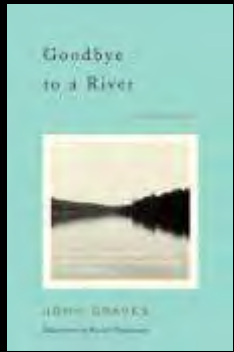
## Knowing a place

Really knowing, I mean – from childhood up and continuously, with all of it a flavor in you...Not just being able to make a little seem a lot; there is enough of that around. I can give you as much book data about the home life of the yellow-breasted chat as the next man can. Nor do I mean vague mystic feeling of unity with Comanche and Neanderthal as one wanders the depleted land, gun at the ready, a part of the long flow of man's hunting compulsion. I mean knowing....

So that what one does in time, arriving a bit late at an awareness of the swindling he got – from no one, from the times – is to make up the shortage as best he may, to try to tie it all together for himself by reading and adult poking.

But adult poking is never worth a quarter as much as kid poking, not in those real terms.

There's never the time for that whole interest later, or ever quite the pure and subcutaneous receptiveness, either. 160



## Roy Bedichek 1878-1959



All his books were written at the end of his life. Walter Prescott Webb and J. Frank Dobie arranged for him to spend a year before his retirement writing his first book at Webb's Friday Mountain ranch, about sixteen miles southwest of Austin.

*Adventures with a Texas Naturalist* (1947)

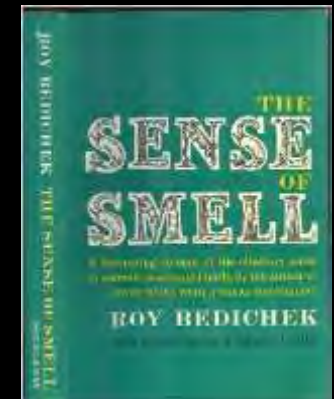
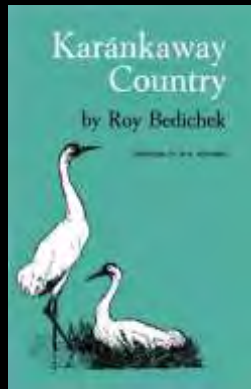
*Karankaway Country* (1950)

posthumous *The Sense of Smell* (1960).

1947

1950

1960





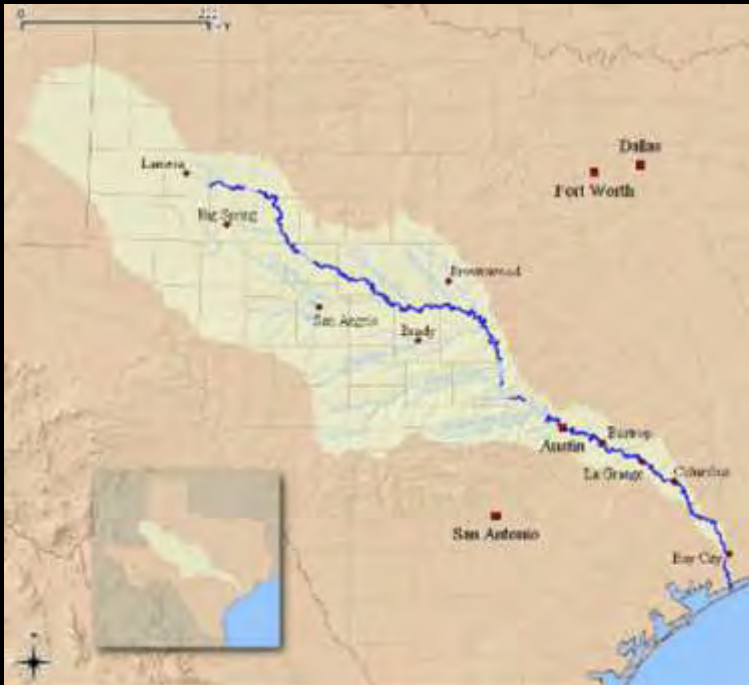
## Karánkaway Country - Bedichek and the Colorado River

“Rivers intrigue me. I can sit on a log and look upon a flowing stream for an hour at a time without feeling those twinges of conscience which come while idling in other environments.”

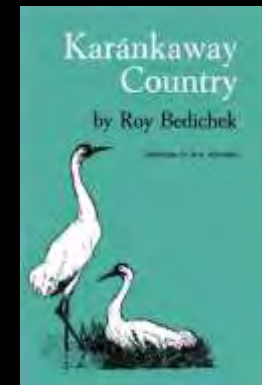
18

“I have seen in my boyhood days the crown and upper slopes of gentle hills, on which the black soil is mixed with fragmented limestone, produce ninety bushels of oats to the acre. Now many of these slopes are all bleached out, pale as death, and really dead in so far as ability to support vegetable life is concerned. Many old-timers have seen bale-to-the-acre land in 1883 abandoned as worthless in 1903.”

279



1950





From John Graves, *Myself and Strangers*

Journal entry Oct 4, 1955

Reading Bedichek, *Adventures with a Texas Naturalist*. A very pleasant hodgepodge. I suppose all nature writers in English are influenced by the same British models in terms of form – White's *Selbourne*, Lord Grey, etc. – which in some hands becomes license to have no form at all. Bedichek shares many of my own prejudices against nature-destruction and artificiality, but surely he needs to smile when he says that seeing the vermilion flycatcher for the first time is a major event in one's life. It might even be true, but the smile would help.

Altogether, however, he is an even-tempered, sadly amused man of intelligence, taking himself a little seriously, but don't we all?



Texas has a river unity  
which invites unified  
treatment of Texas rivers

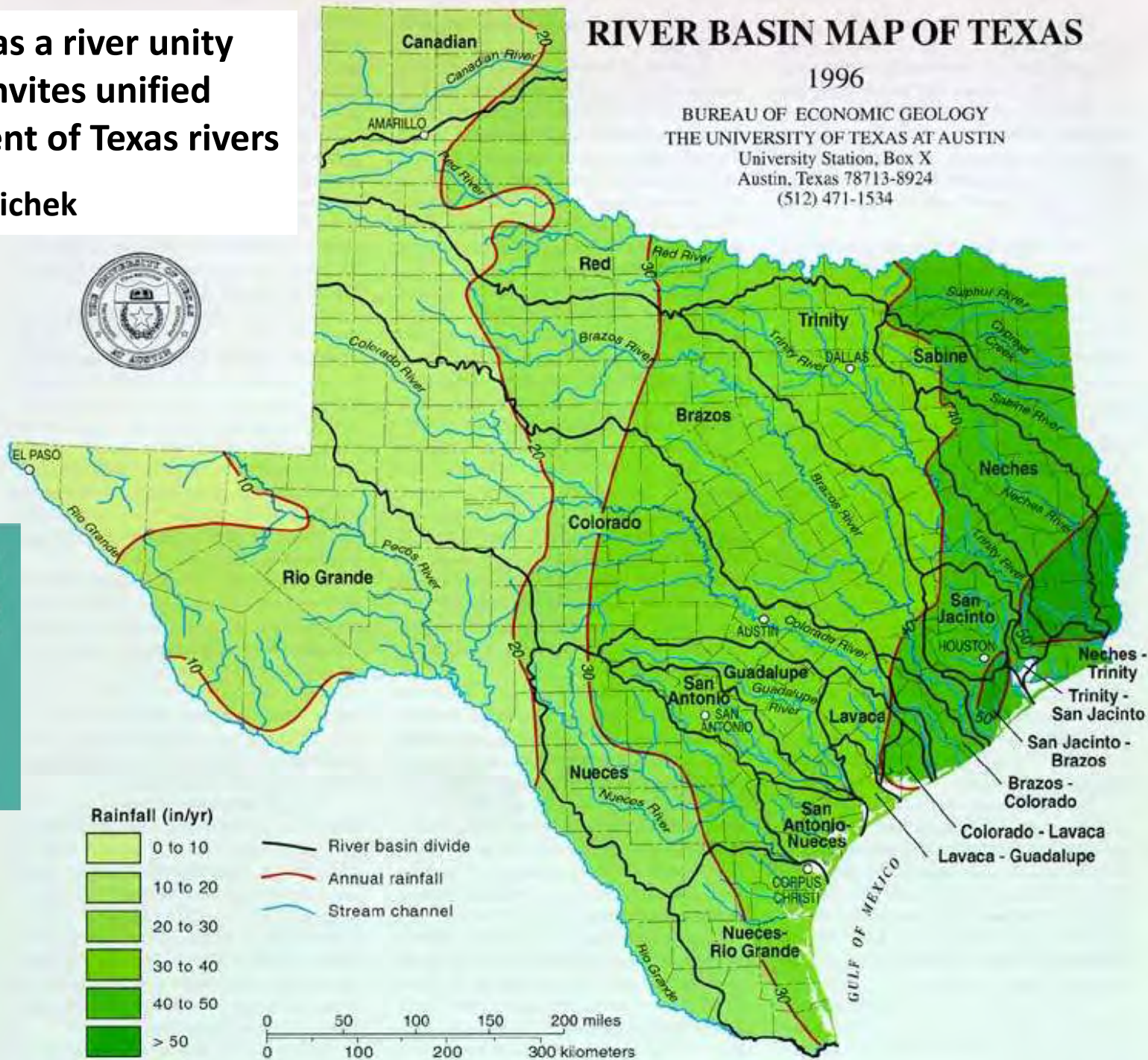
Roy Bedichek



# RIVER BASIN MAP OF TEXAS

1996

BUREAU OF ECONOMIC GEOLOGY  
THE UNIVERSITY OF TEXAS AT AUSTIN  
University Station, Box X  
Austin, Texas 78713-8924  
(512) 471-1534

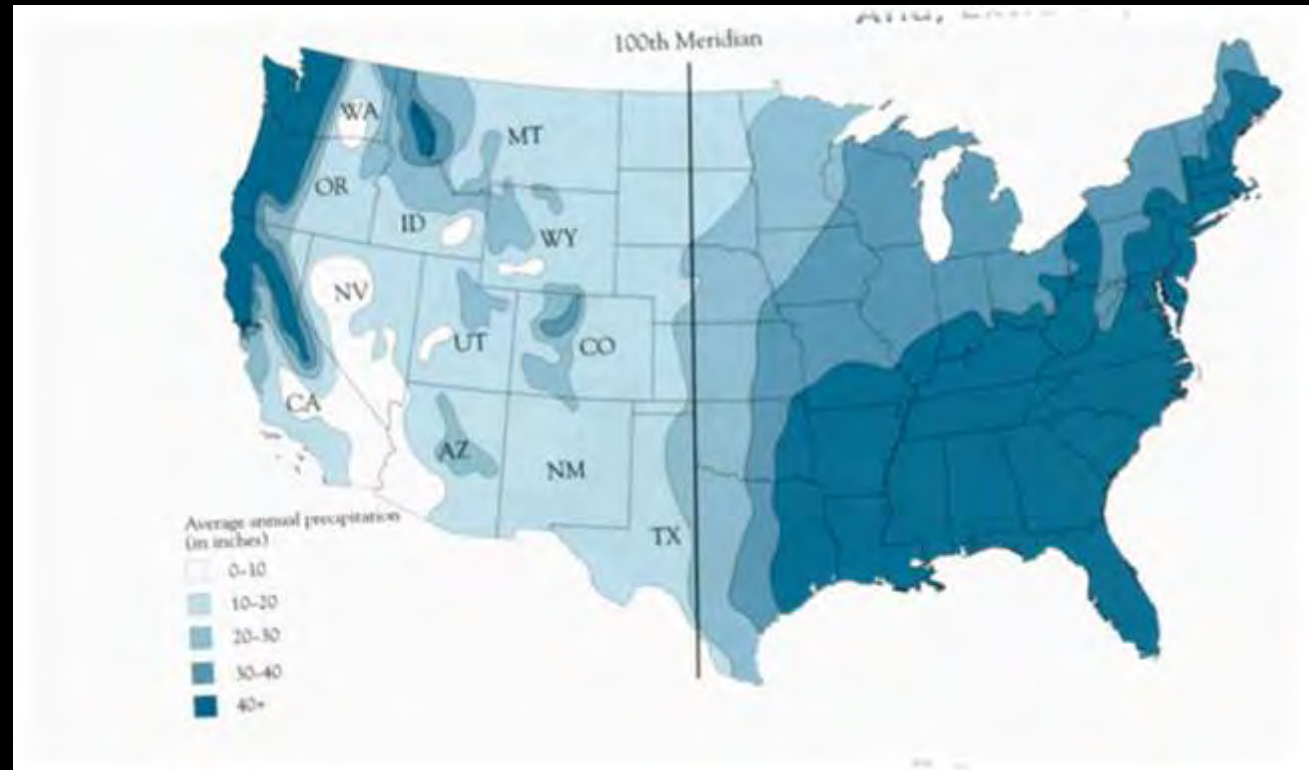
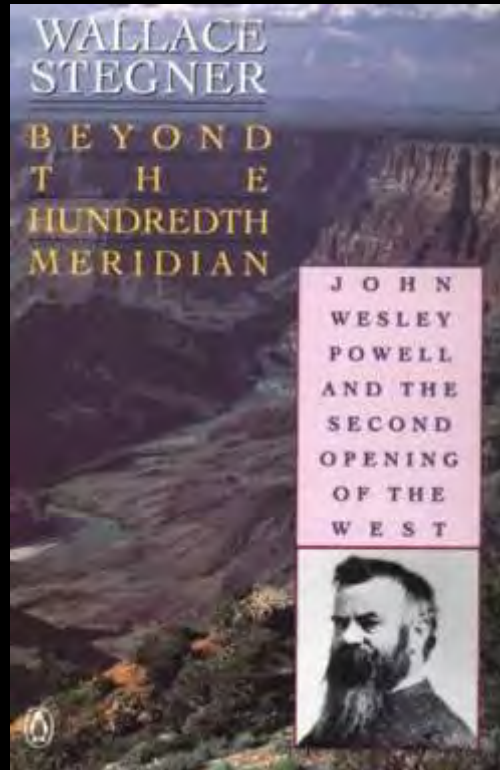


Karankaway  
Country

by Roy Bedichek



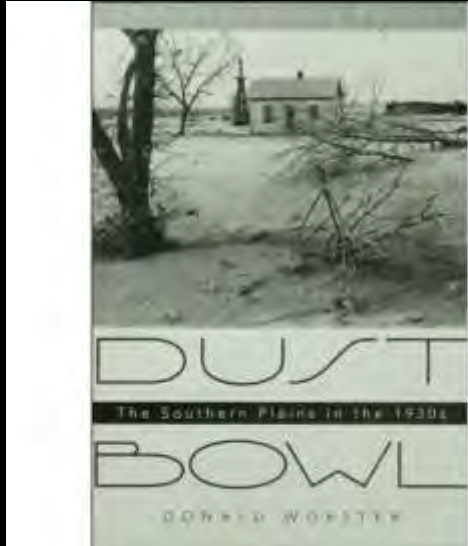
# Beyond the 100<sup>th</sup> Meridian and The Great American Desert



Powell's expeditions led to his belief that the arid West was not suitable for agricultural development, except for about 2% of the lands that were near water sources.

His *Report on the Lands of the Arid Regions of the United States* proposed irrigation systems and state boundaries based on watershed areas (to avoid squabbles).

For the remaining lands, he proposed conservation and low-density, open grazing.



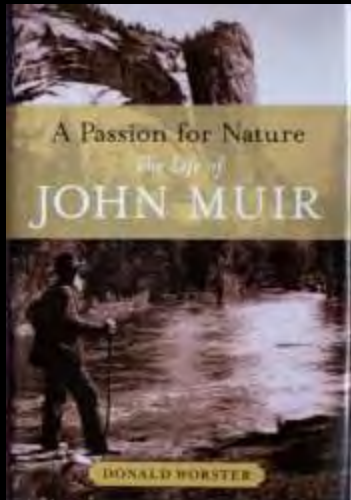
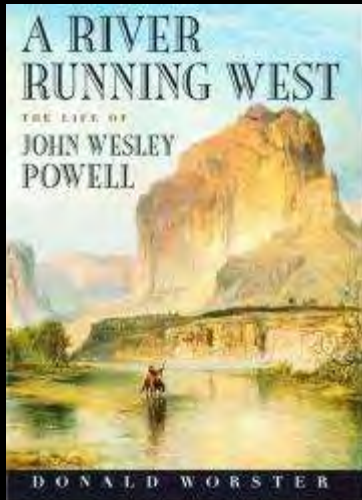
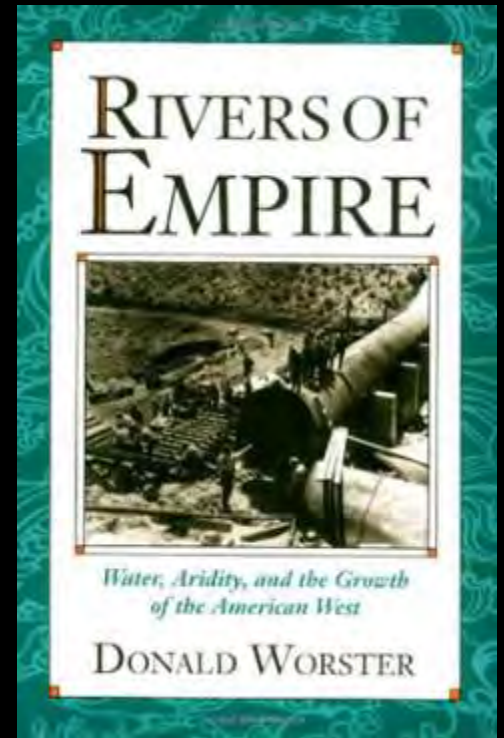


# THE WEST WITHOUT WATER

WHAT PAST FLOODS, DROUGHTS,  
AND OTHER CLIMATIC CLUES  
TELL US ABOUT TOMORROW

B. Lynn Ingram  
Frances Malamud-Roam





# The Geography of American Rivers





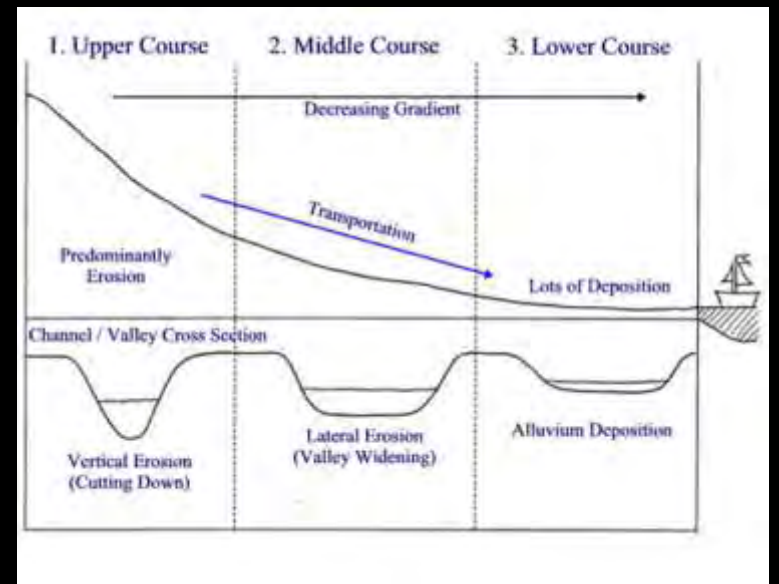
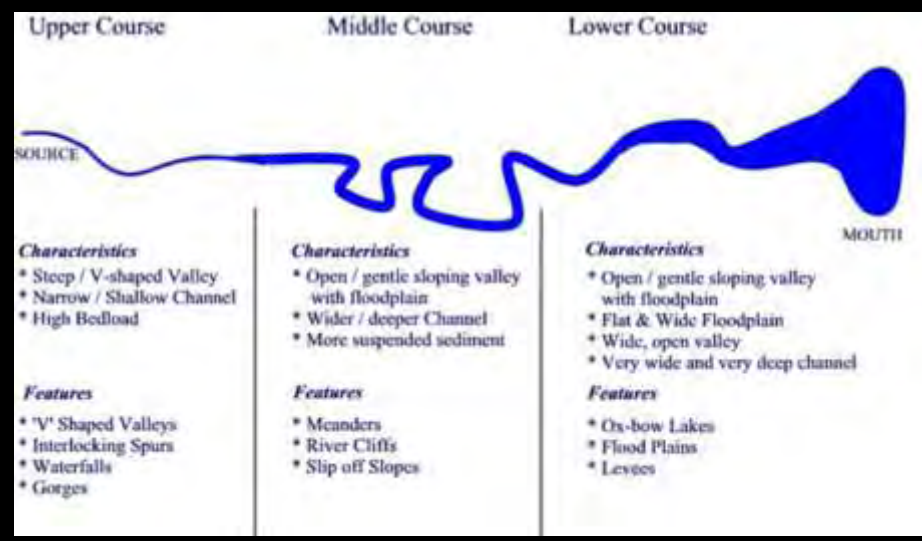
# The Life of a River – William Morris Davis (1850 - 1934)

An American geographer, geologist, geomorphologist, and meteorologist, often called the "father of American geography".

His most influential scientific contribution was the cycle of erosion, first defined around 1884, which was a model of how rivers create landforms. His cycle of erosion suggests that (larger) rivers have three main sections: upper course, middle course, and lower course - each of which has distinct landforms and other properties associated with it.



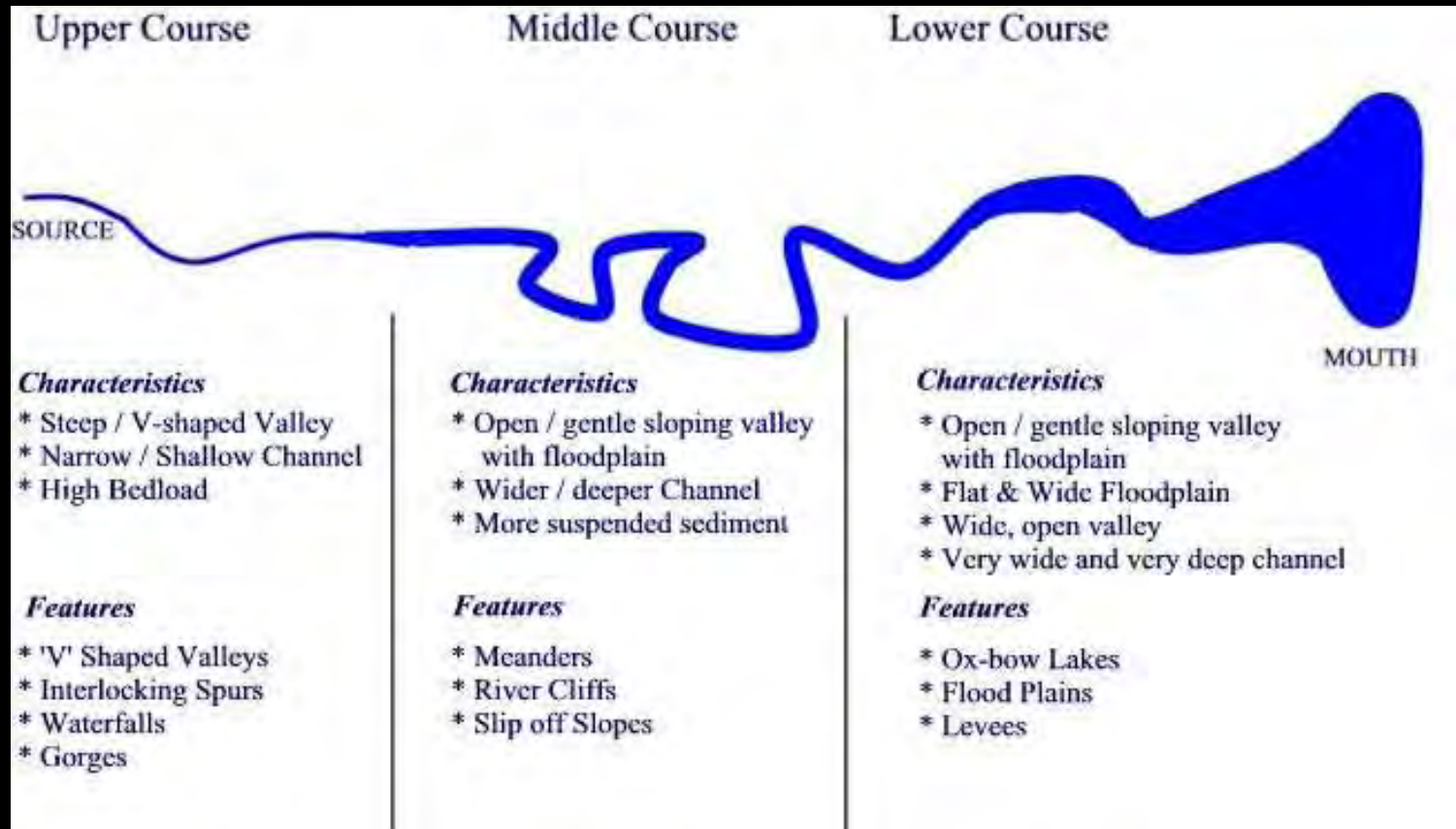
“The Life of a River” - He viewed the river system as having a life of its own. “Its youthful headwaters are steep and rugged. It rushes toward the sea, eroding bed and bank on its way. In its central part, it is mature, winding sedately through wide valleys adjusted to its duty of transporting water and sediment. Near its mouth it has reached, in its old age, a nearly level plain through which it wanders in a somewhat aimless course toward final extinction as it joins the ocean that had provided the sustaining waters through its whole life span.”



# River Course

## Fluvial Geomorphology

Sinuosity is inversely proportional to slope



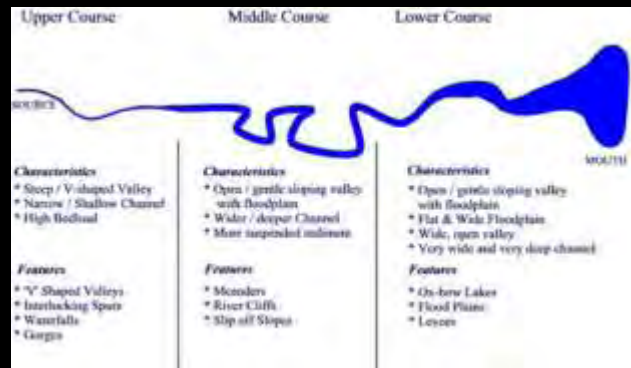
## The Upper Course - Youthful Headwaters



# Upper Course - Source

## Erosion and Transportation

## Oxygen and Life



River sources are usually small and, in the case of mountain streams, steep and erosional.

In temperate environments, small streams tend to be shaded by an interlocking, overhead tree canopy.

Such conditions result in cool, well-oxygenated streams that are abundantly supplied with a food base of leaves.

Fine particles of organic matter are released as the leaves are broken down by biological communities in the streams

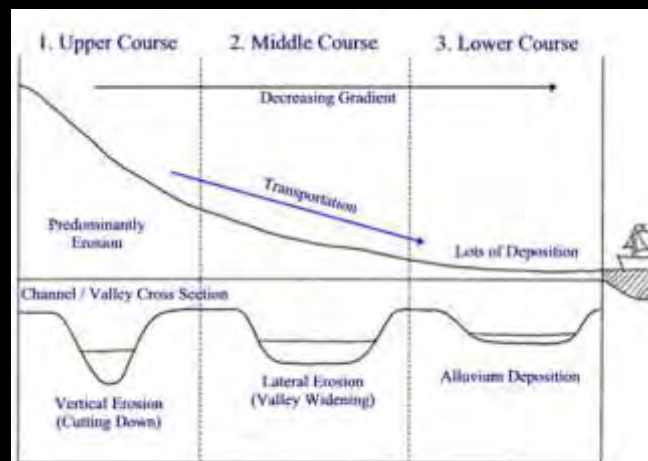


# The Middle Course – its duty of transporting water and sediment

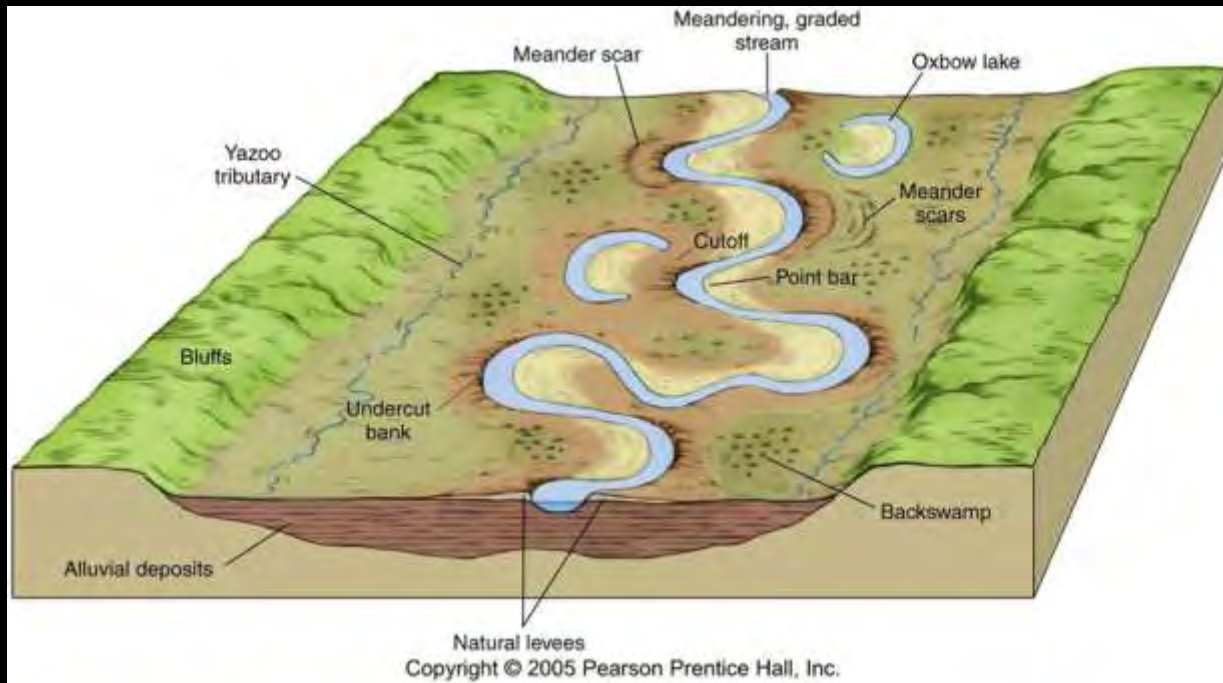
Erosion → Transportation → Deposition



Sinuosity is inversely proportional to slope

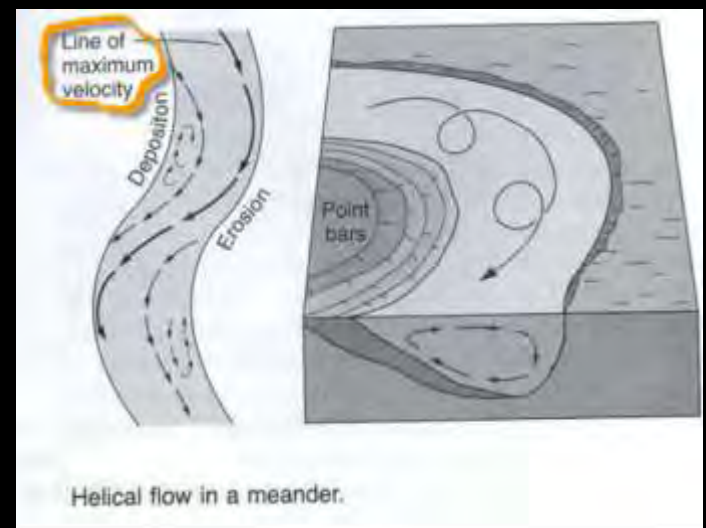


# The Middle Course: The Meander Belt



## A Meander

The helical flow continues to erode the outside of the bend and deepens the pool.



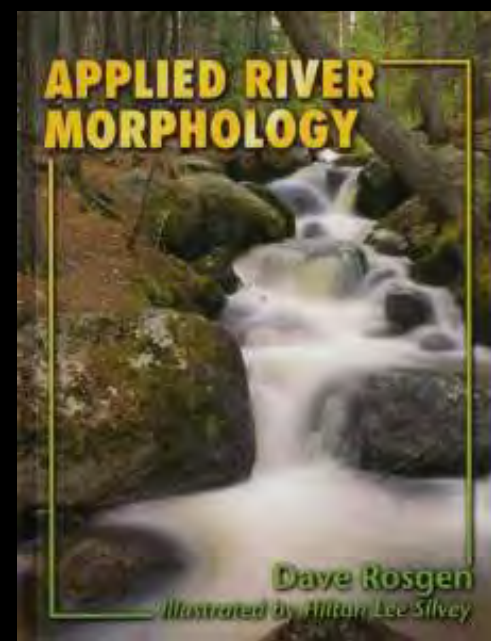
# River Morphology

Dave Rosgen, a former hydrologist with the U.S. Forest Service and now Principal Hydrologist of Wildland Hydrology Consultants.

Rosgen's system is based on the notion that the most effective classification system is one based on objective, quantifiable criteria that are readily observable and measurable in the field.

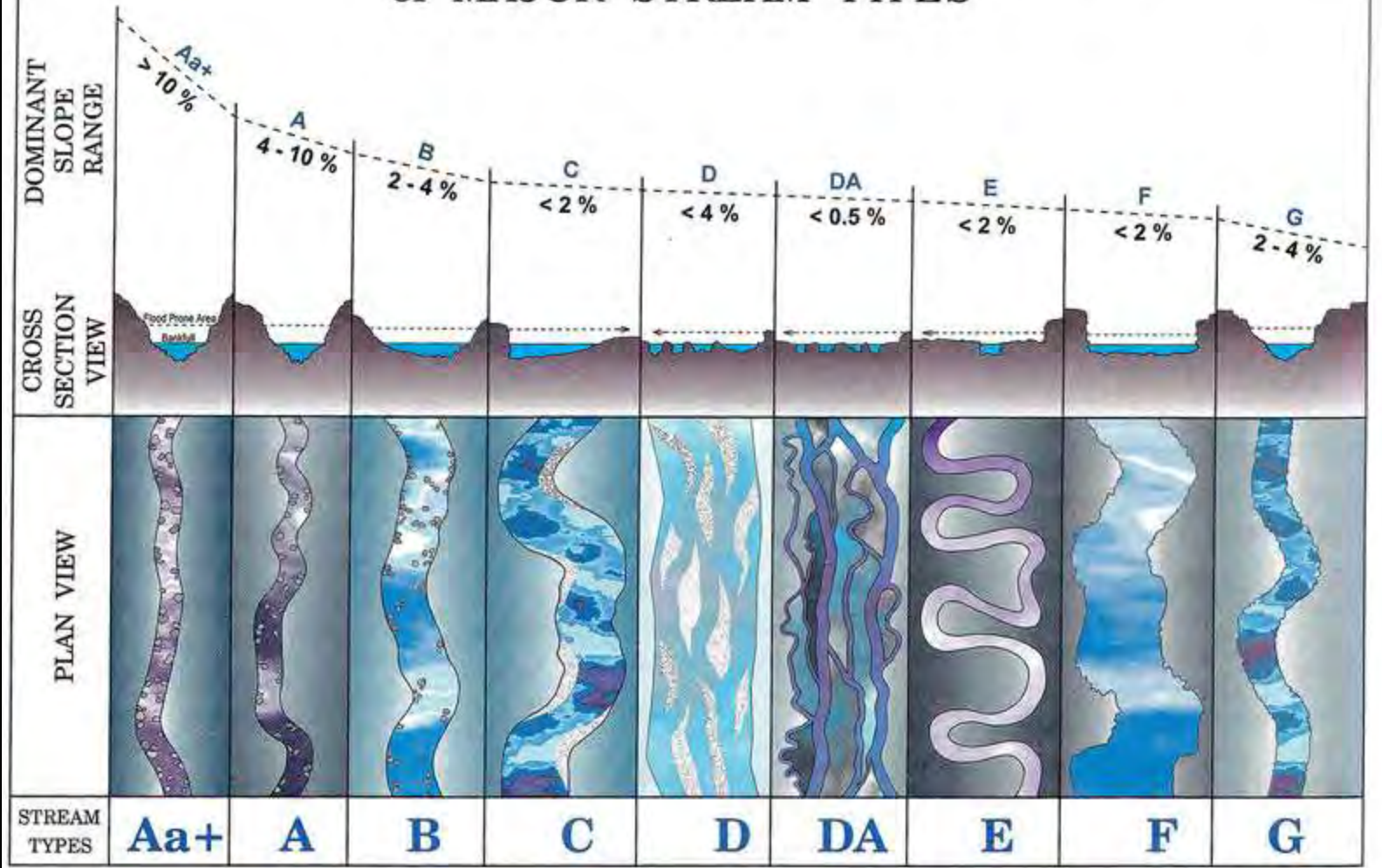


Stream TYPE	A	B	C	D	DA	E	F	G
Dominate Bed Material								
Bedrock	1							
Boulder	2							
Cobble	3							
Gravel	4							
Sand	5							
Silt-Clay	6							
Entrchmnt	< 1.4	1.4 - 2.2	> 2.2	n/a	> 4.0	> 2.2	< 1.4	< 1.4
WD Ratio	< 12	> 12	> 12	> 40	< 40	< 12	> 12	< 12
Sinuosity	1 - 1.2	> 1.2	> 1.2	n/a	variable	> 1.5	> 1.2	> 1.2
Slope	.04-.099	.02-.039	< .02	< .04	< .005	< .02	< .02	.02-.039



Applied River Morphology . Pagosa Springs: Wildland Hydrology Books, 1996. [www.wildlandhydrology.com](http://www.wildlandhydrology.com)

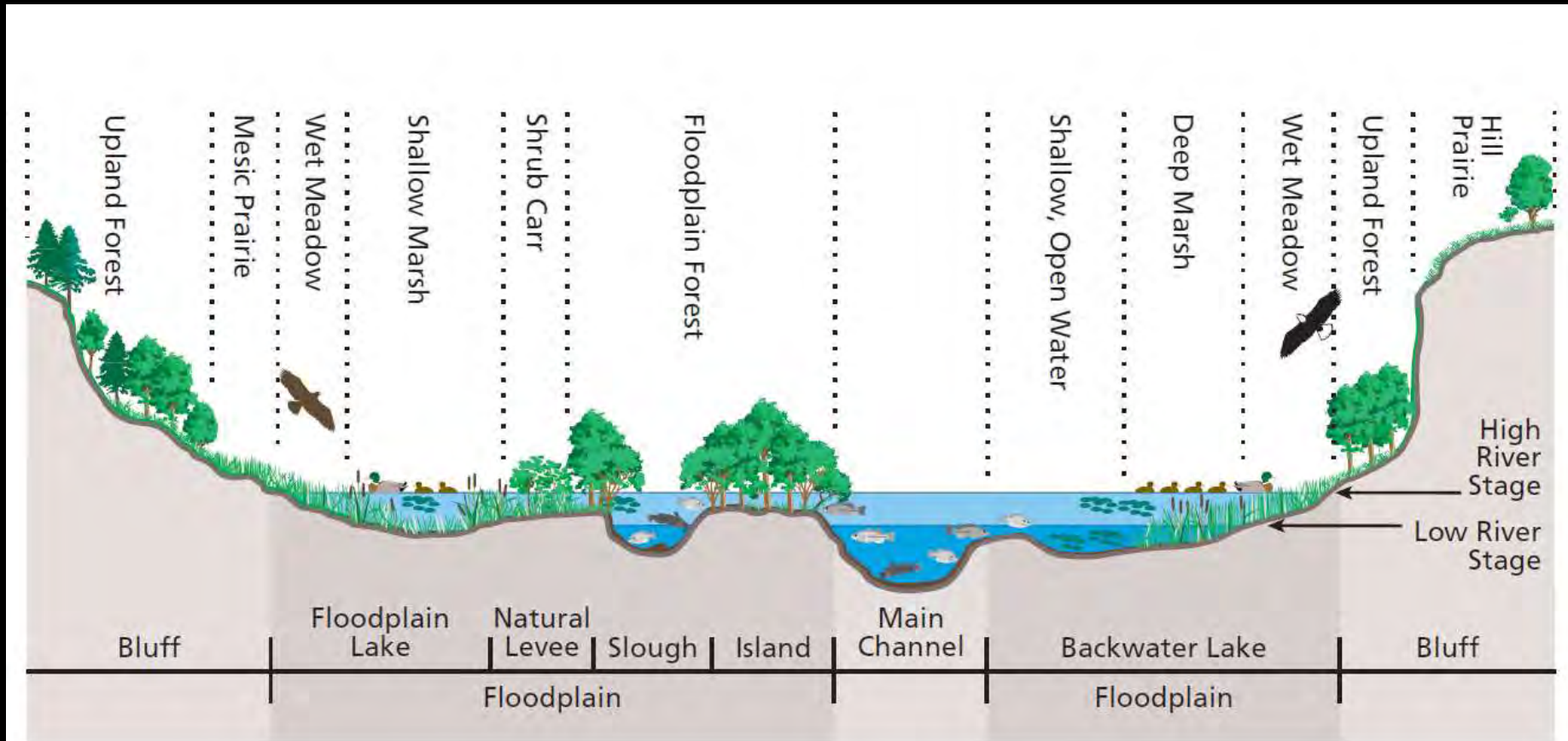
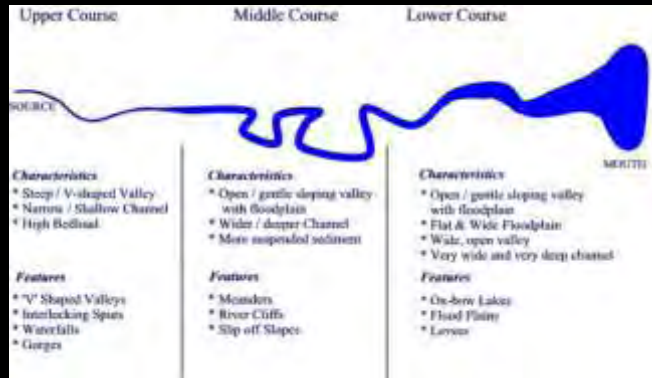
# LONGITUDINAL, CROSS-SECTIONAL and PLAN VIEWS of MAJOR STREAM TYPES



sinuosity is inversely proportional to slope



# The Middle Course: Life in the Meander Belt



## Life in the Meander Belt

### Hornsby Bend

At some point along their path to the sea, rivers have typically gained enough water and width to preclude interlocking tree canopies.

Streams at this point are warmer and less abundantly supplied with leaves than was the case upstream.

Open canopy, and fairly shallow water, means that light can reach the river benthos, increasing in-stream primary productivity.



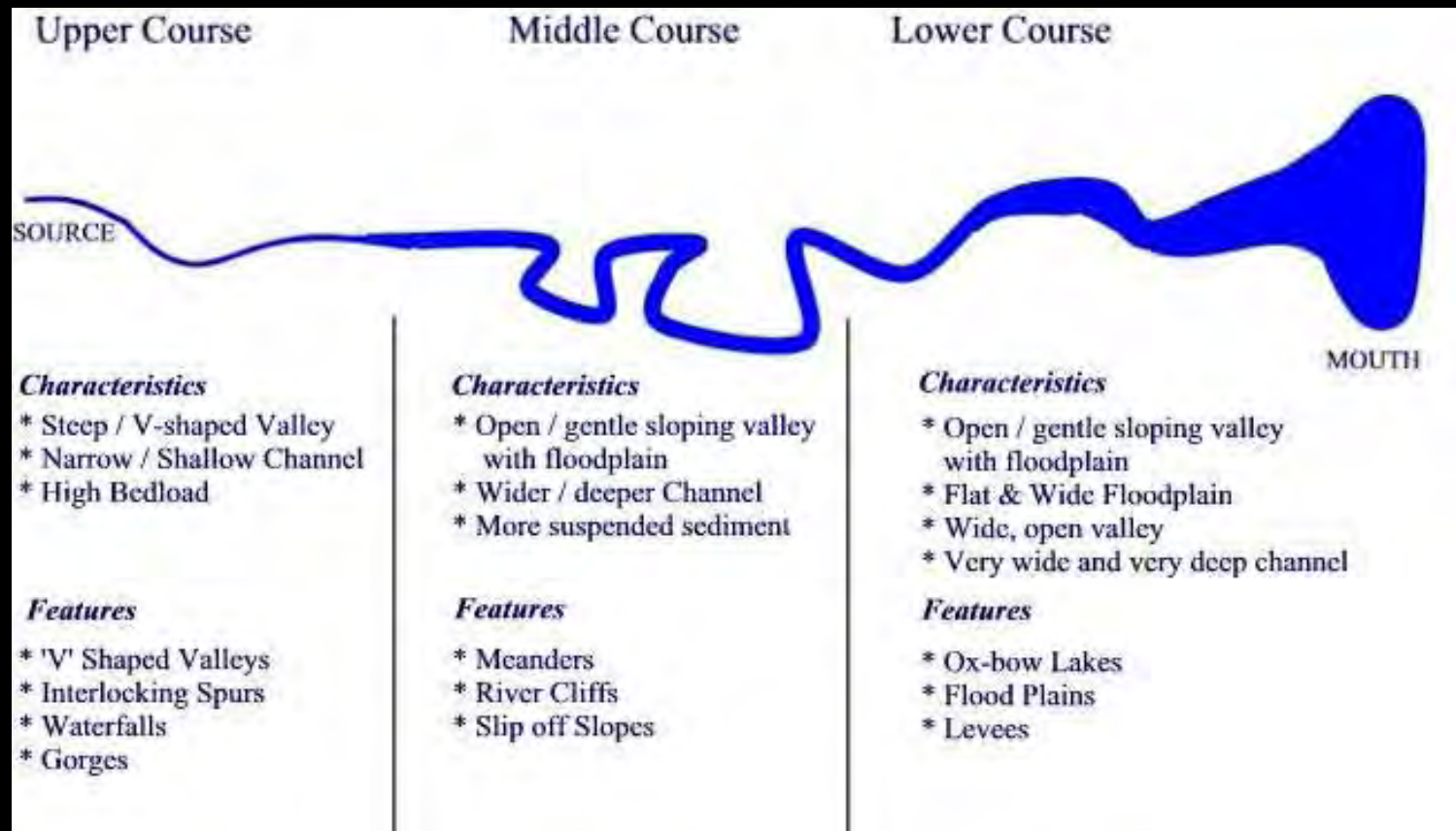
## Life in the Meander Belt

All that is gold does not glitter,  
Not all those who wander are lost...

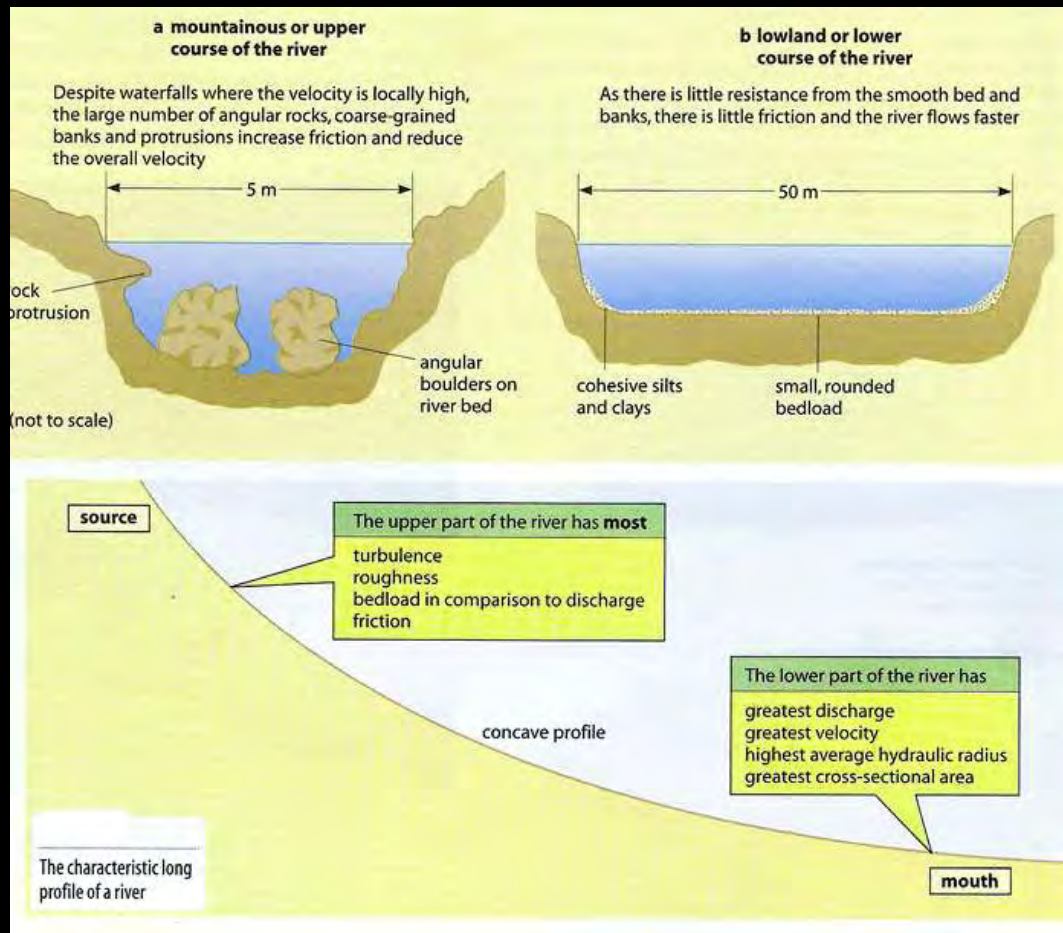
J.R.R. Tolkien



# The Lower Course – Old Age Wandering and Deposition



# "DOWNSTREAM CHANGE OF VELOCITY IN RIVERS" LUNA B. LEOPOLD



	DISCHARGE
	OCCUPIED CHANNEL WIDTH
	CHANNEL DEPTH
	MEAN VELOCITY
	VOLUME OF LOAD
LOAD PARTICLE SIZE	
CHANNEL BED ROUGHNESS	
GRADIENT	

# Delta - final extinction as it joins the ocean

## The literal Goodbye to a River

River deltas form at the mouth of the river



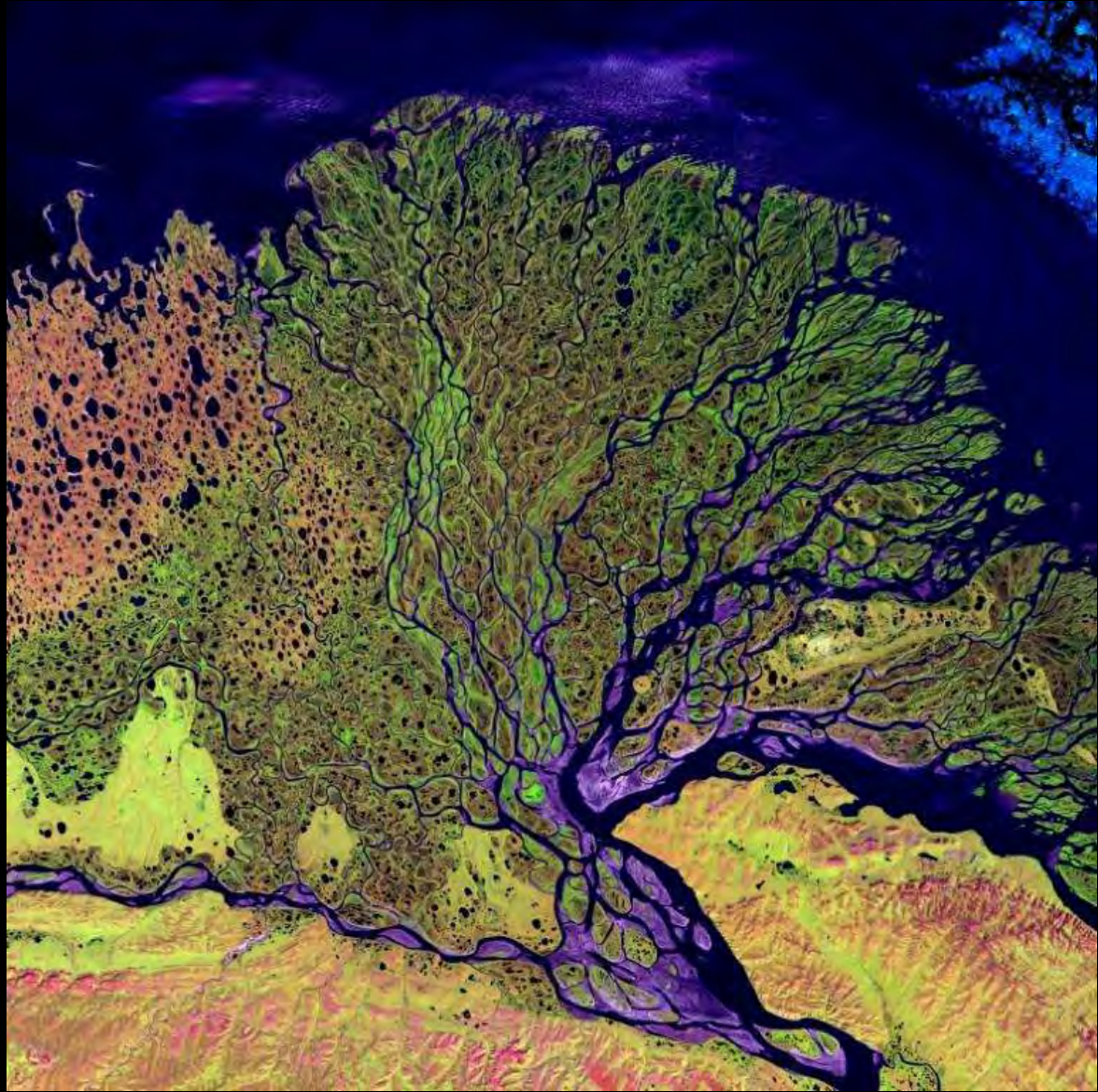
The Danube Delta is the second largest river delta in Europe, after the Volga Delta.

The greater part of the Danube Delta lies in Romania, while its northern part, on the left bank of the Chilia arm, is situated in Ukraine .

The approximate surface is 4,152 km<sup>2</sup>, of which 3,446 km<sup>2</sup> are in Romania.



The Lena River, some 2,800 miles (4,400 km) long, is one of the largest rivers in the world. At the end of the Lena River there is a large delta that extends 100 km into the Laptev Sea and is about 400 km (250 mi) wide. The delta is frozen tundra for about 7 months of the year, but in May transforms the region into a lush wetland for the next few months. The Lena Delta Reserve is the most extensive protected wilderness area in Russia. It is an important refuge and breeding ground for many species of Siberian wildlife.





# Fluvial Philosophy - Heraclitus c. 535 – c. 475 BC

A Greek philosopher of Ephesus, Heraclitus propounded a distinctive theory which he expressed in oracular language.

He is best known for his doctrines that things are constantly changing (universal flux or process) and that fire is the basic material of the world.

Plato indicates the source of the flux doctrine:

"Heraclitus, I believe, says that all things go and nothing stays, and comparing existents to the flow of a river, he says you could not step twice into the same river" (Plato *Cratylus*)

What Heraclitus actually said is the following:

"On those stepping into rivers staying the same, other and other waters flow."

Understand?



Heraclitus by Johannes Moreelse (1602–1634)

The image depicts him as "the weeping philosopher" wringing his hands over the world, and as "the obscure" dressed in dark clothing—both traditional motifs.

Heraclitus “On those stepping into rivers staying the same, other and other waters flow.”

We call a body of water a “river” precisely because it consists of changing waters.

If the waters should cease to flow it would not be a river, but a lake or a dry streambed.

There is a sense, then, in which a river is a remarkable kind of existent –

one that remains what it is by changing what it contains.





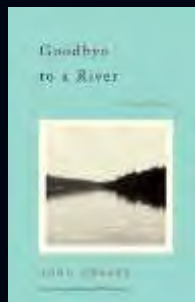
You could go on forever. You know it. Your muscles have gone supple-hard and your hands as crusty as dry rawhide, and your head is cleared, and your boat goes precisely, unstrenuously where and how you want it to go, and all your gear falls into its daily use with thoughtless ease.

There is merely not enough river, not enough time...

You are spare, bare, and ascetic. You knew Saint Henry, Yankee moralist though he might be, and knew too all those other old loners who'd ever baked their bread by fires in manless places.

You knew the sovereign pulse of being.

Or you thought you did...



## Reverence for Rivers - Wendell Berry b. 1934

### The Peace Of Wild Things

When despair grows in me  
and I wake in the middle of the night at the least sound  
in fear of what my life and my children's lives may be,  
I go and lie down where the wood drake  
rests in his beauty on the water, and the great heron feeds.  
I come into the peace of wild things  
who do not tax their lives with forethought  
of grief. I come into the presence of still water.  
And I feel above me the day-blind stars  
waiting for their light. For a time  
I rest in the grace of the world, and am free.



## The Round River – Aldo Leopold

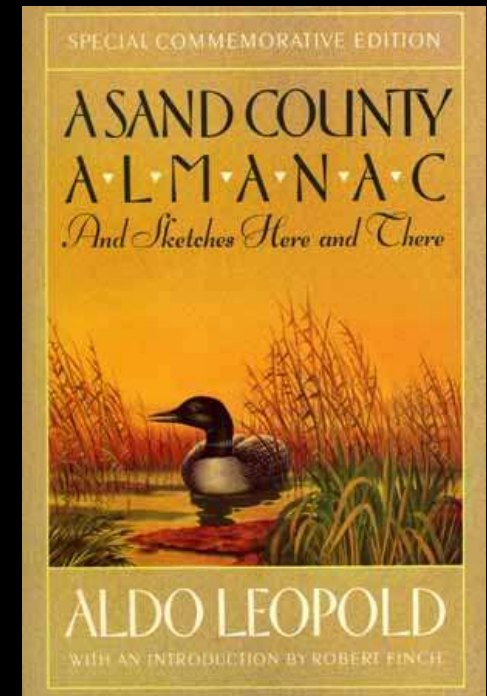
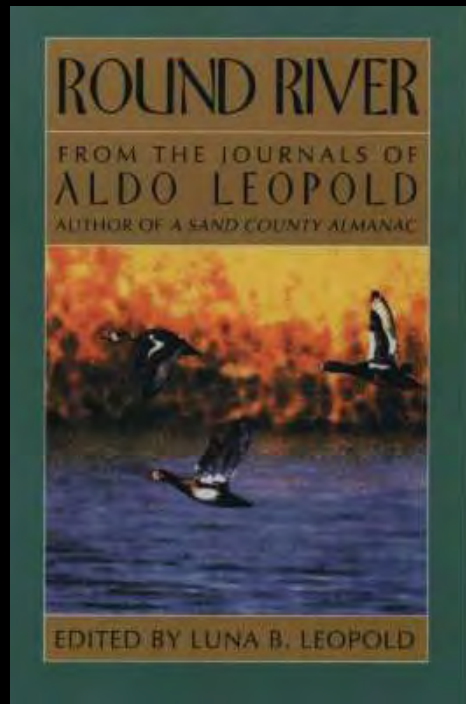
"One of the marvels of early Wisconsin was the Round River, a river that flowed into itself, and thus sped around and around in a never-ending circuit.

Paul Bunyan discovered it, and the Bunyan saga tells how he floated many a log down its restless waters."

### Metaphor for ecology

"a river that flows into itself"

Aldo Leopold 1887-1948



## Round River

Ecology is an infant just learning to talk, and, like other infants, is engrossed with its own coinage of big words.

Its working days lie in the future.

Ecology is destined to become the lore of Round River, a belated attempt to convert our collective wisdom of biotic materials into a collective wisdom of biotic navigation.

This, in the last analysis, is conservation.

