Riparian and appropriation-based water law concepts: issues and challenges for dealing with drought

FLOW 2018- Workshop, April 24, 2018

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Thanks to Bob Caccese for his work on water law, and development of presentations, over time!

Water law *follows hydrology and assumes that regional water balances will remain relatively constant or "stationary" over time;* ***however, this assumption is no longer valid.***

- Dan Tarlock, "How Well Can Water Law Adapt to the Potential Stresses of Global Climate Change," 14 U. Denv. Water L. Rev. 1, 2 (2010).

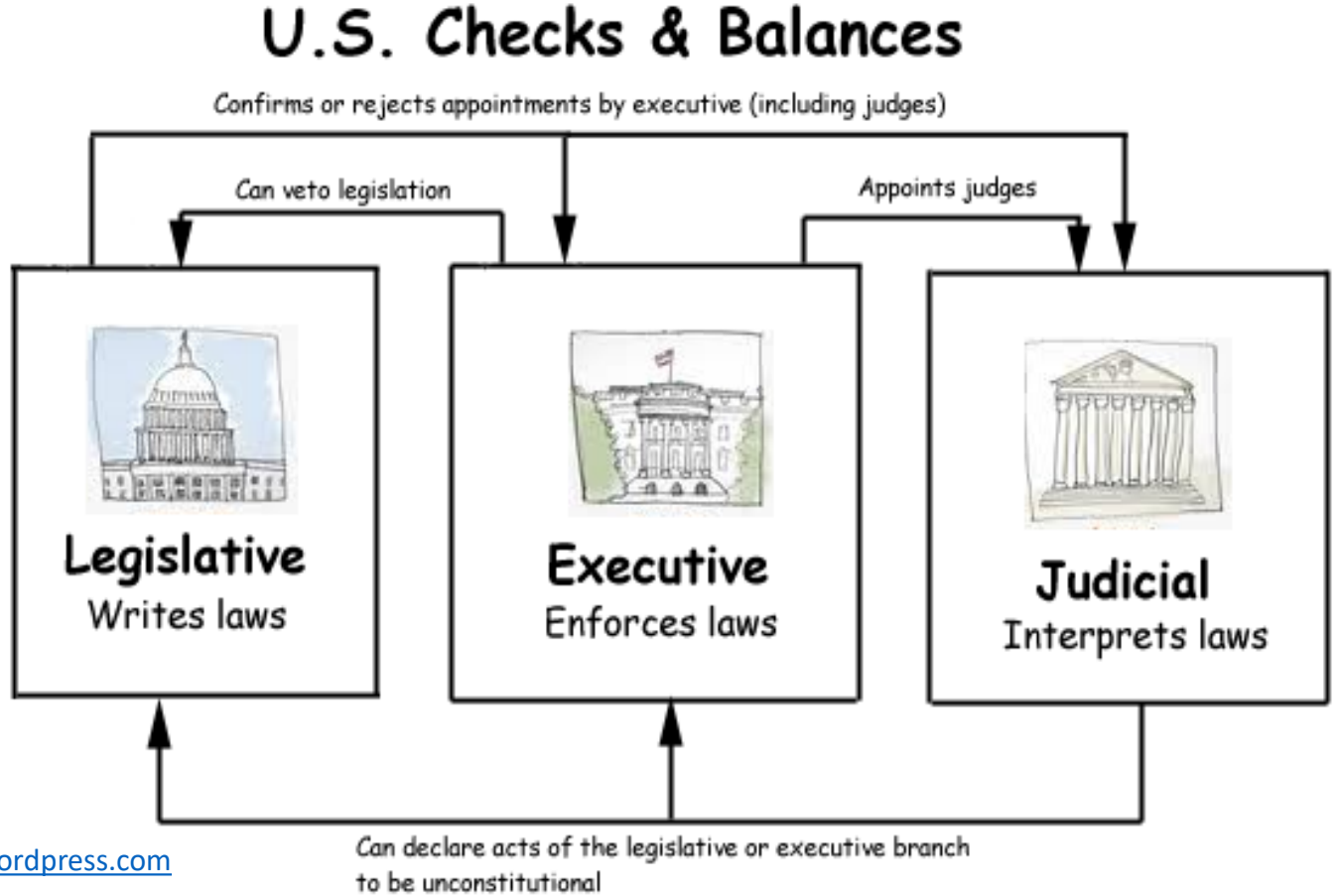
http://urbanh2oplanner.com/dev_v1/wp-content/uploads/2015/03/Uncertainties-e1426376668414-940x600.png

Overview

1. Sources of “law”
2. Introduction to historic basis for water law
   - Riparian rights
   - Prior appropriation
   - Groundwater
   - Interstate allocation
3. Impacts from changing climate and other challenges
4. What can be done?

Part 1: There are several sources of "law" that matter for water allocation and management

Constitution



geopolicraticus.wordpress.com

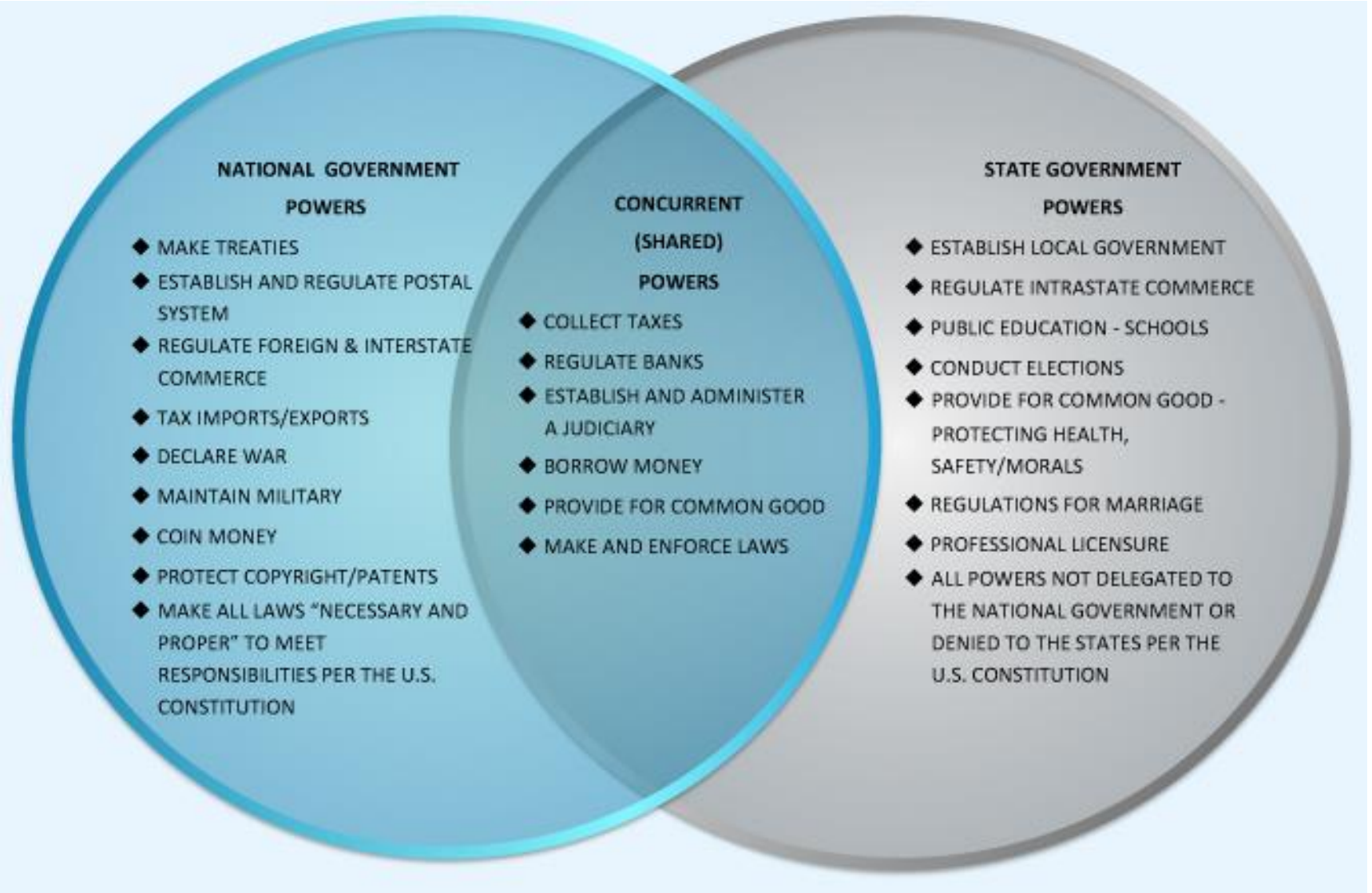
Statutes

Court cases
- Common law
- Interpretation of other types of law

Administrative codes

Executive orders

The “federalist system” is premised on a system of shared government between the federal and state governments



The doctrine of pre-emption can be quite important: has the federal or state government spoken on a particular issue?

- Types of preemption
  - Express preemption:
    - Law explicitly prevents state/local law from addressing particular topics.
  - Conflict pre-emption:
    - State/local law superseded because it creates conflict.
  - Field pre-emption:
    - Federal/state law is so comprehensive that it "occupies the field" and leaves no room for state/local control.

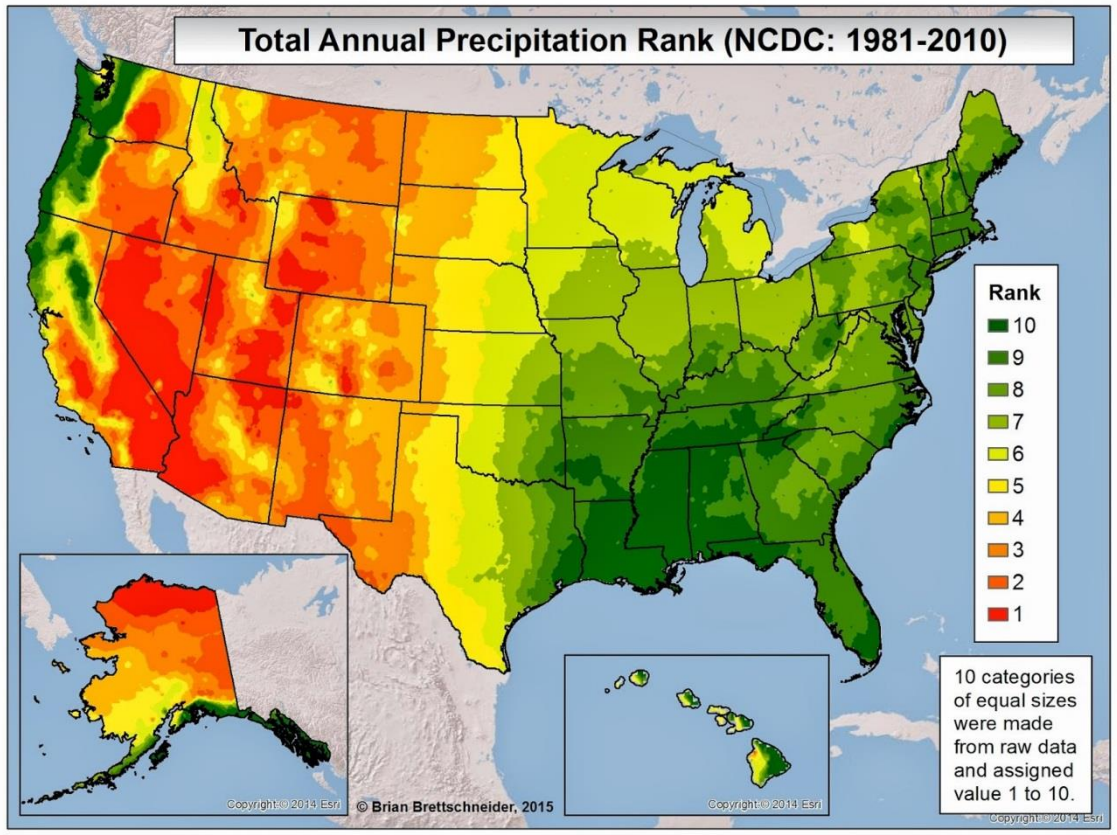
http://blogs.law.harvard.edu/environmentallawprogram/files/2013/03/Municipalities-and-Hydraulic-Fracturing-Trends-in-State-Preemption.pdf

http://crossroads.newsworks.org/index.php/local/keystone-crossroads/72804-why-does-pa-have-so-many-local-governments-

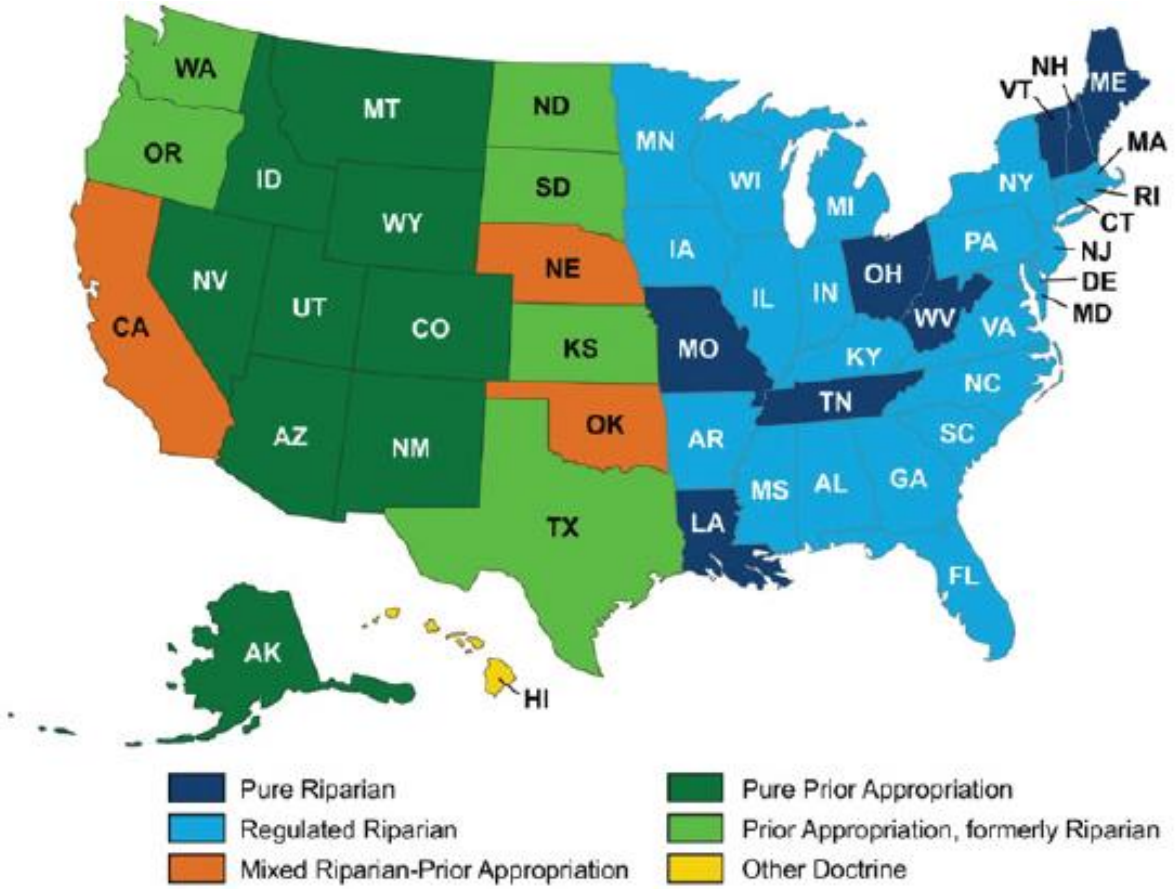
Part 2: What is “water law”?
It can be many things, depending on your perspective.
Today’s focus is on water allocation.

- Drinking water: Safe Drinking Water Act, state departments of health
- Wastewater: Clean Water Act
- Stormwater: Clean Water Act
- Flooding: National Flood Insurance Program, State laws
- Water Quality: Clean Water Act
- Endangered Species Act
- Water allocation:
  - Surface water codes
  - Groundwater codes
  - Allocation between states- Constitutional doctrine

Water law in the U.S. developed in response to hydrology, precipitation patterns, and historic events



http://3.bp.blogspot.com/xA_PeOWXd5s/VQ2x4wMtv7I/AAAAAAAADas/w8P7gapkHh0/s1600/US_Dreary_Days_Precip2.jpg

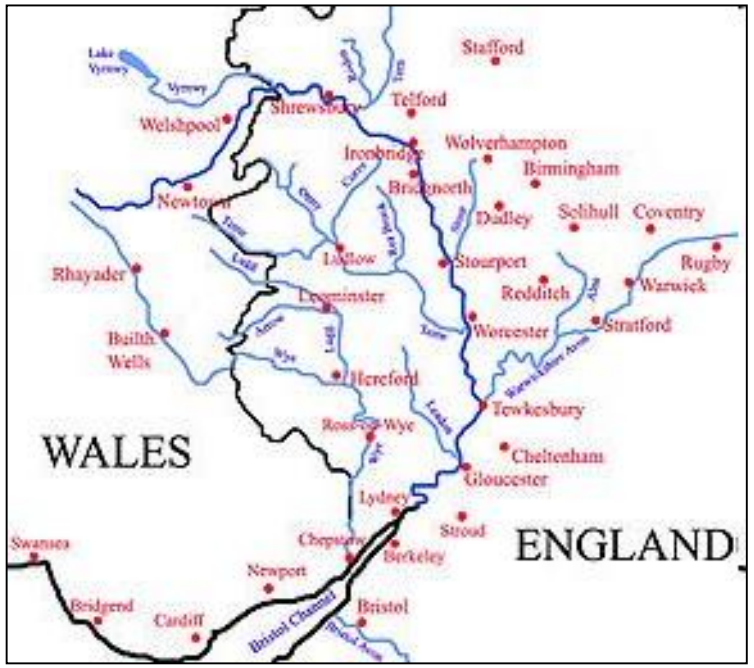


Source: U.S. Dept. of Energy (2014)

A different look at water availability in the U.S.

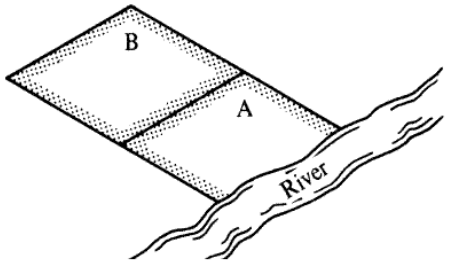
http://pacinst.org/american-rivers-a-graphic/

Early settlers brought the riparian doctrine from England, where there is a relatively high density of rivers and streams



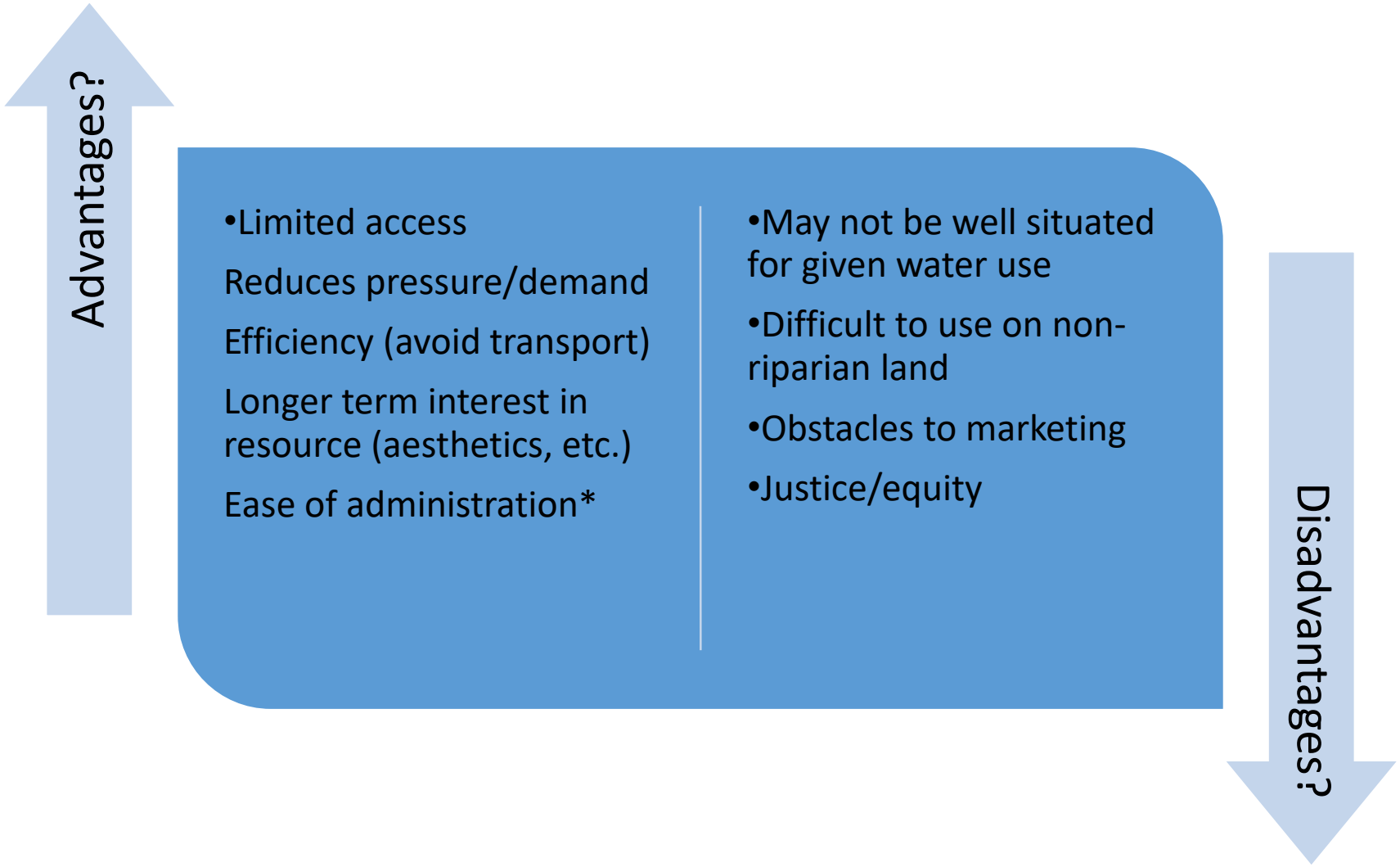
http://www.woodlands.co.uk/blog/woodland-activities/what-are-riparian-rights/#

http://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_lwm_riparian_zones



- Historical basics:
  - Adjoining landowners have right to “reasonable use” (quantity & quality)
  - Share and share alike (including in times of drought/shortage)
  - No export from basin, but no time element (new users ok)

The “common law” doctrine of riparian rights historically had several advantages and disadvantages



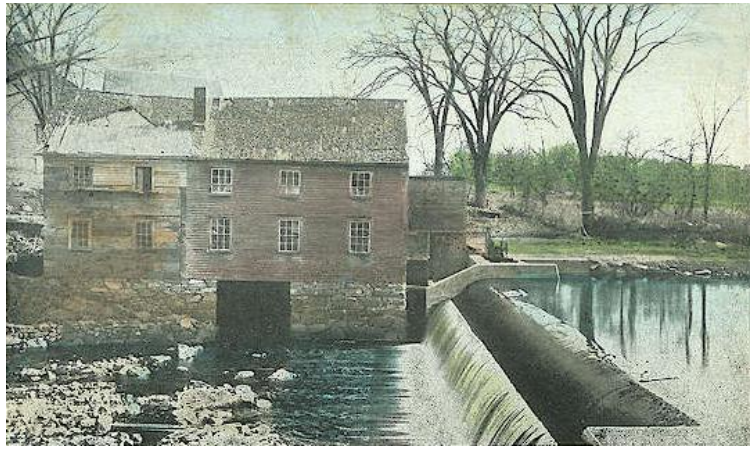
Riparian rights include several important attributes: rights of access, to build a dock, to withdraw water, water stock, and even regulate flow

http://www.nashville.gov/portals/0/SiteContent/Parks/images/outdoor/Outdoor%20Rec/Harpeth%20river%20hwy%20100%20access.bmp

https://offthebeatenpagetravel.files.wordpress.com/2011/09/dsc03199.jpg

http://www.pennlive.com/editorials/index.ssf/2011/05/susquehanna_river_basin_commis.html

https://bloximages.newyork1.vip.townnews.com/lancasteronline.com/content/tncms/assets/v3/editorial/a/6f/a6f57c22-96a7-11e4-bd57-03e035aa9950/54ad907f9f303.image.jpg?resize=1200%2C900



https://upload.wikimedia.org/wikipedia/commons/b/b3/Old_Mill_%26_Dam%2C_Durham%2C_NH.jpg

The historic limits of the riparian doctrine began to shift in response to demands from cities

- Challenges:
  - Cities/municipal suppliers need a lot of water
  - Most water users in cities not riparian landowners– transfer across watershed boundaries
  - Hard to classify water uses

- Common law reaction:
  - Classify city/municipality as riparian
  - Must own/purchase riparian land (eminent domain ok)

Factors determining “reasonable use” invite litigation

Water withdrawals

Changes in Surface Water Flow

Social Value of Use

Harm to other riparian users

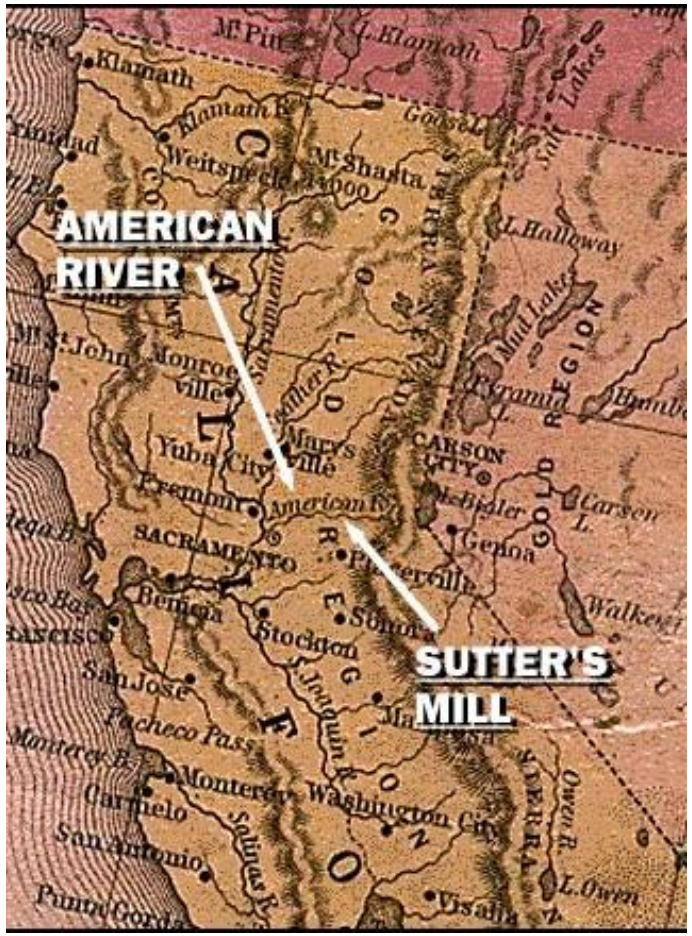
Duration of use

Benefits to user

Benefits to the environment

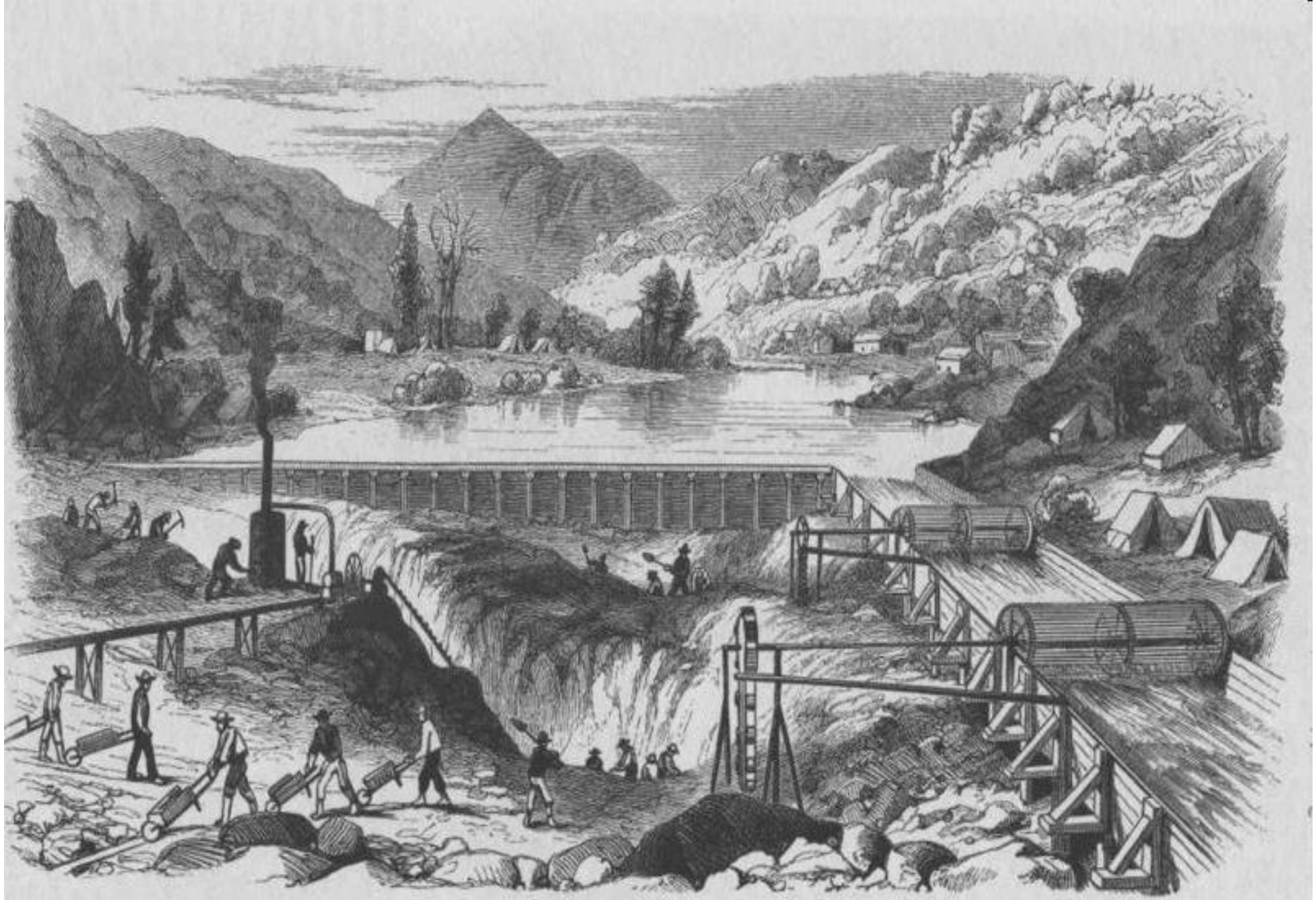
Economic Value of Use

Starting in the 1840s, the Gold Rush and the practices in mining camps fundamentally changed water law…



Critical elements of “prior appropriation”:

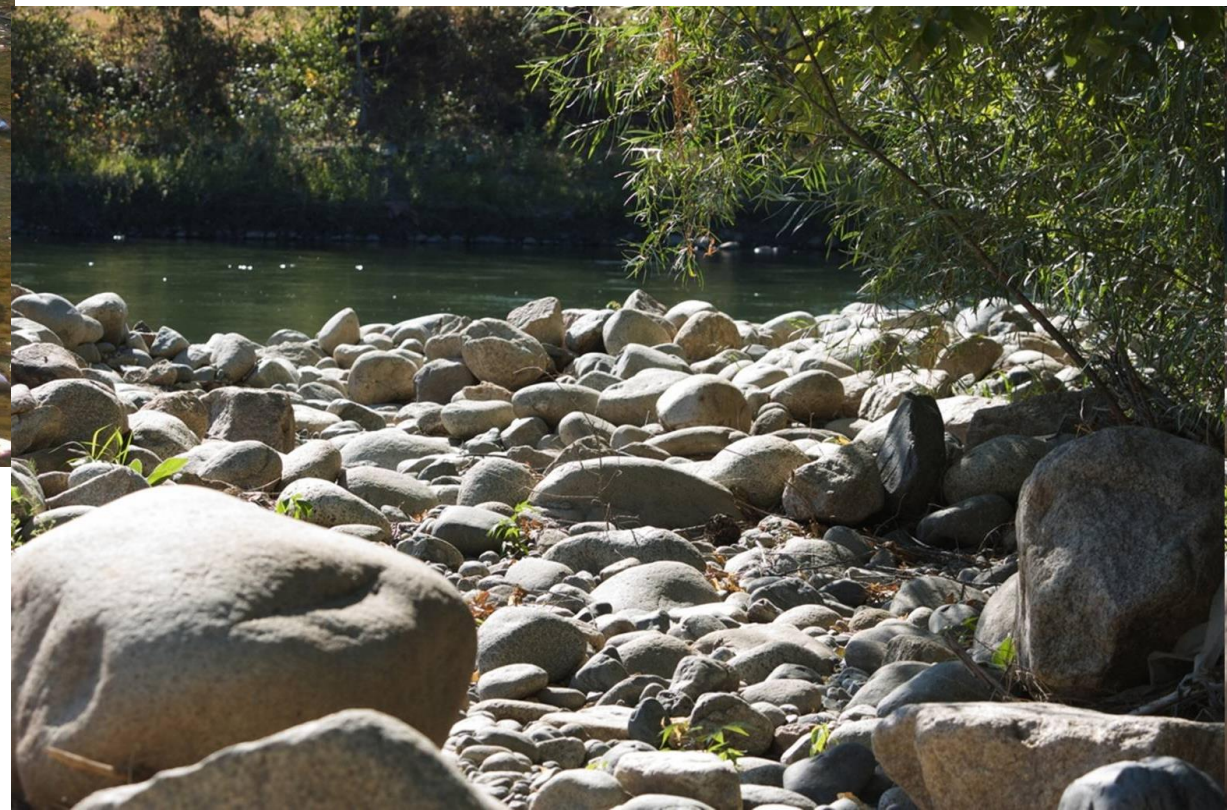
- First in time, first in right
- Actual diversion
- Beneficial use
- Use it or lose it



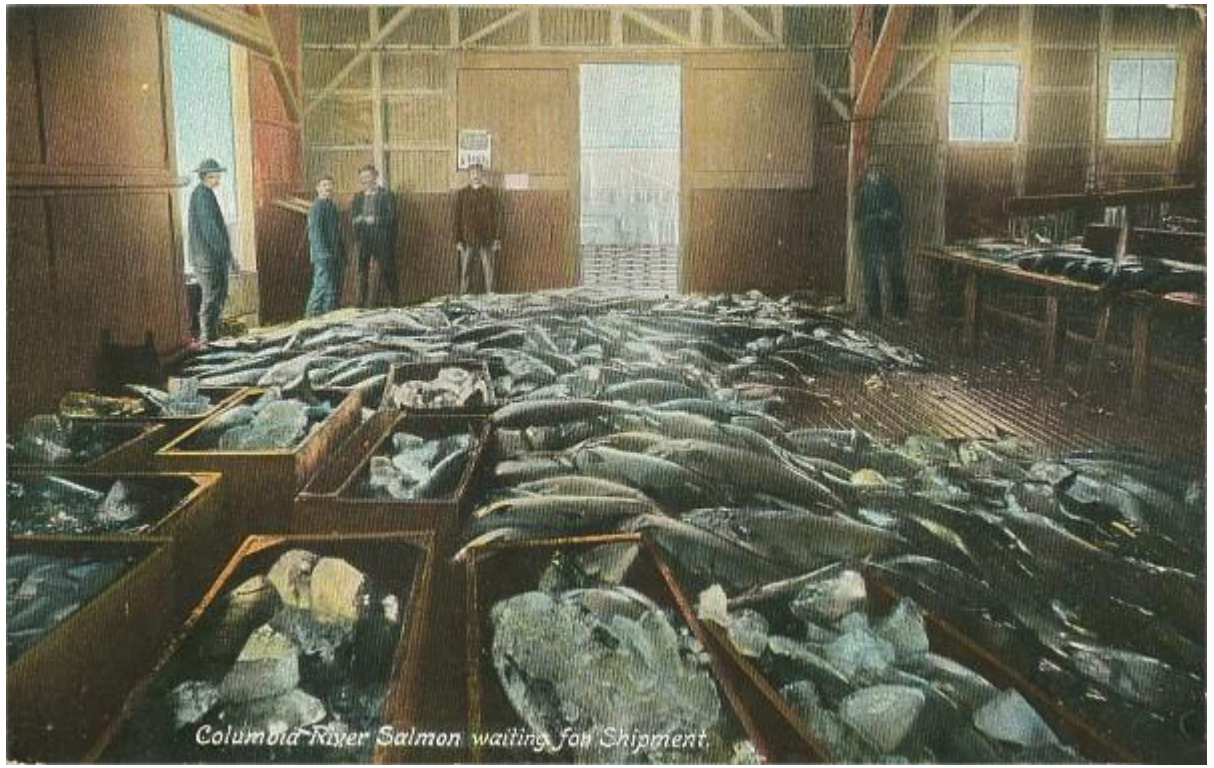
RIVER OPERATIONS AT MURDERER'S BAR.

Mining had huge impacts on the landscape and waterways

By many, water going to the ocean was seen as wasted. Under the doctrine of prior appropriation, drying up a stream has been fine (no allowance for instream flows).



Early attitudes and values were compounded by the abundance of fish: “so many fish you could walk across their backs”



In 1866, Congress passed the Mining Act, recognizing the right to use water according to "local customs, laws, and the decisions of the courts"

SEC. 8. *And be it further enacted*, That the right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted. Right of way for highways.

SEC. 9. *And be it further enacted*, That whenever, by priority of possession, rights to the use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and the decisions of courts, the possessors and owners of such vested rights shall be maintained and protected in the same; and the right of way for the construction of ditches and canals for the purposes aforesaid is hereby acknowledged and confirmed: *Provided, however*, That whenever, after the passage of this act, any person or persons shall, in the construction of any ditch or canal, injure or damage the possession of any settler on the public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage. Owners of vested rights to use of water for mining, &c. to be protected, and right of way for canals and ditches granted. Damages.

https://www.loc.gov/law/help/statutes-at-large/39th-congress/session-1/c39s1ch262.pdf

Over time, states formally adopted the doctrine of prior appropriation- first for surface water, then for groundwater

Colorado

- Surface water:
  - By court, 1872.
  - By legislature, 1919
- Groundwater: 1965 for designated gw basins

Washington State

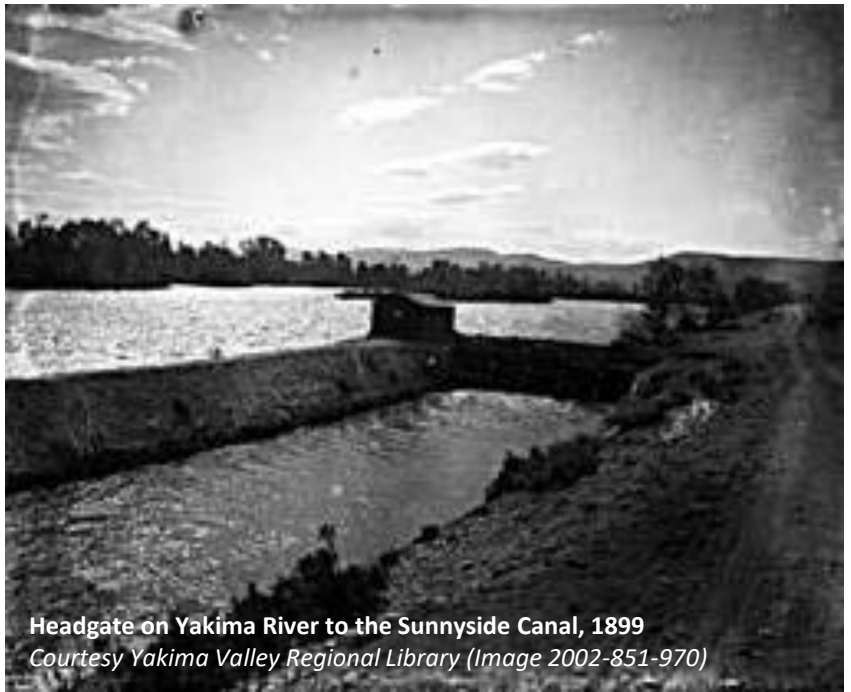
- Surface water: 1917
- Groundwater: 1945

Oregon

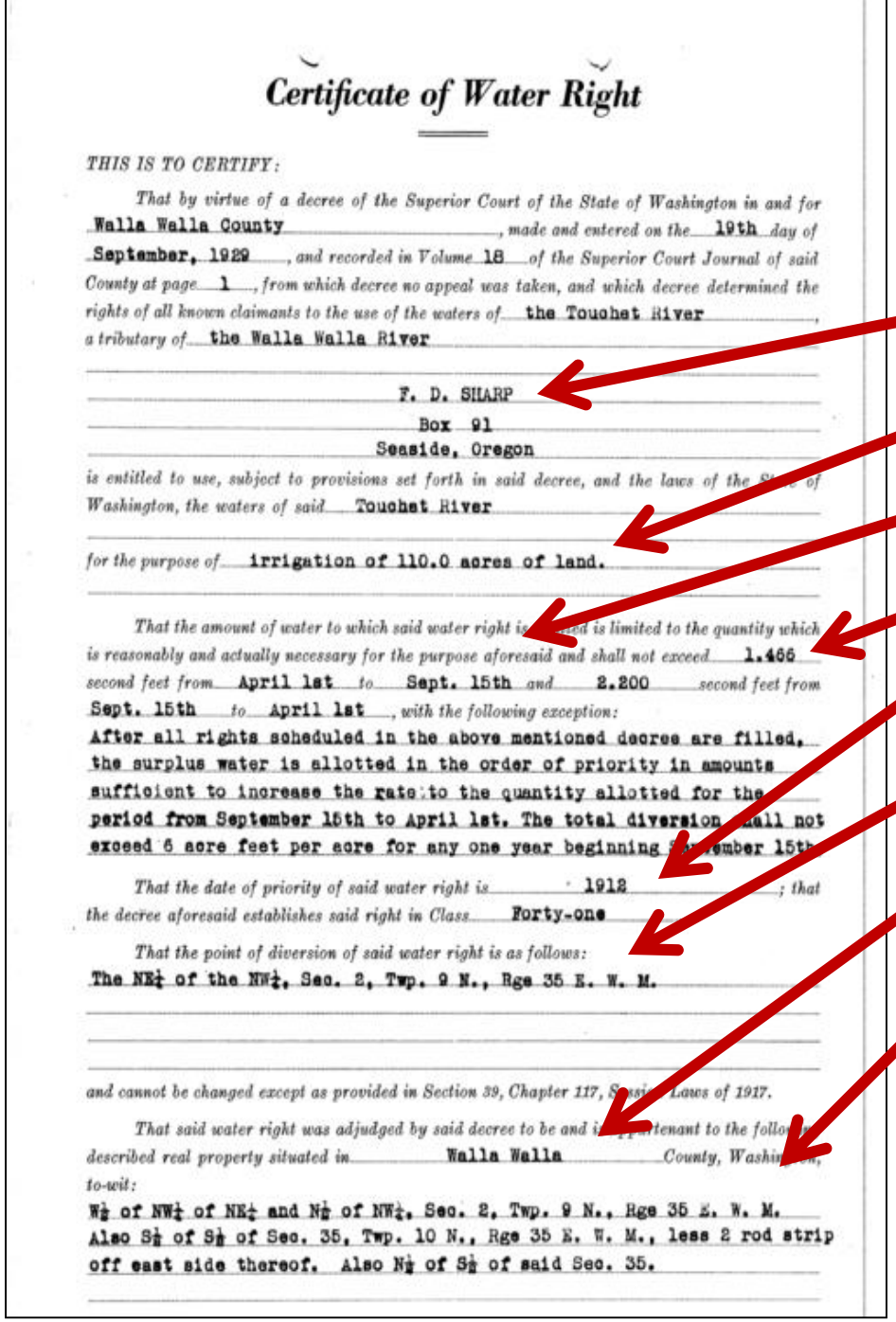
- Surface water: 1909
- Groundwater: 1955

California

- Surface Water: 1872 (revised in 1914)
- Groundwater: 2015



Headgate on Yakima River to the Sunnyside Canal, 1899
Courtesy Yakima Valley Regional Library (Image 2002-851-970)



Certificate of Water Right

THIS IS TO CERTIFY:

That by virtue of a decree of the Superior Court of the State of Washington in and for Walla Walla County, *made and entered on the* 19th *day of* September, 1929, *and recorded in Volume* 18 *of the Superior Court Journal of said County at page* 1, *from which decree no appeal was taken, and which decree determined the rights of all known claimants to the use of the waters of* the Touchet River, *a tributary of* the Walla Walla River

F. D. SHARP
Box 91
Seaside, Oregon

is entitled to use, subject to provisions set forth in said decree, and the laws of the State of Washington, the waters of said Touchet River

for the purpose of irrigation of 110.0 acres of land.

That the amount of water to which said water right is decreed is limited to the quantity which is reasonably and actually necessary for the purpose aforesaid and shall not exceed 1.466 *second feet from* April 1st *to* Sept. 15th *and* 2.200 *second feet from* Sept. 15th *to* April 1st, *with the following exception:*
After all rights scheduled in the above mentioned decree are filled, the surplus water is allotted in the order of priority in amounts sufficient to increase the rate to the quantity allotted for the period from September 15th to April 1st. The total diversion shall not exceed 6 acre feet per acre for any one year beginning September 15th

That the date of priority of said water right is 1912; *that the decree aforesaid establishes said right in Class* Forty-one

That the point of diversion of said water right is as follows:
The NE¼ of the NW¼, Sec. 2, Twp. 9 N., Rge 35 E. W. M.

and cannot be changed except as provided in Section 39, Chapter 117, Session Laws of 1917.

That said water right was adjudged by said decree to be and is appurtenant to the following described real property situated in Walla Walla *County, Washington, to-wit:*
W½ of NW¼ of NE¼ and N½ of NW¼, Sec. 2, Twp. 9 N., Rge 35 E. W. M. Also S½ of S½ of Sec. 35, Twp. 10 N., Rge 35 E. W. M., less 2 rod strip off east side thereof. Also N½ of S½ of said Sec. 35.

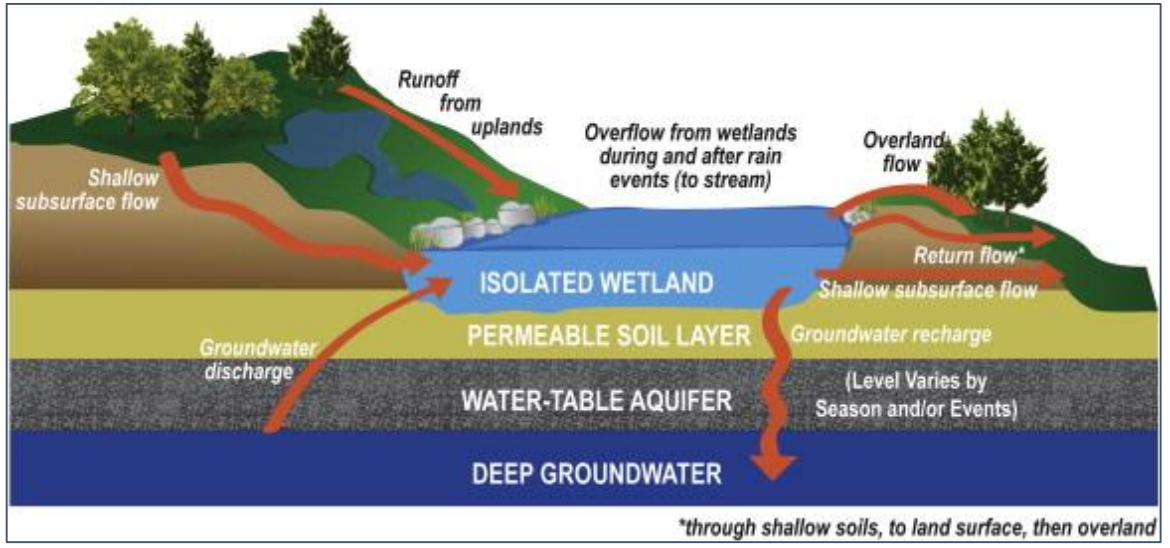
Anatomy of a Water Right

- Original name on water right
- Purpose of use
- Season of use
- Instantaneous quantity (Qi)
- Priority date
- Point of diversion (PoD)
- Place of use (PoU)
- Annual quantity/duty (Qa)

Regulation and management of surface and ground water has historically been different

- *Most states*: surface and groundwater are managed separately, subject to different use rules
- *Select few states*: surface and groundwater are managed together, mostly in cases of hydrological connection between both sources

An 1861 court case in Ohio. [Frazier v. Brown, 12 Ohio St. 294 (1861)] famously concluded that **groundwater** was too "secret, **occult** and concealed" to regulate.

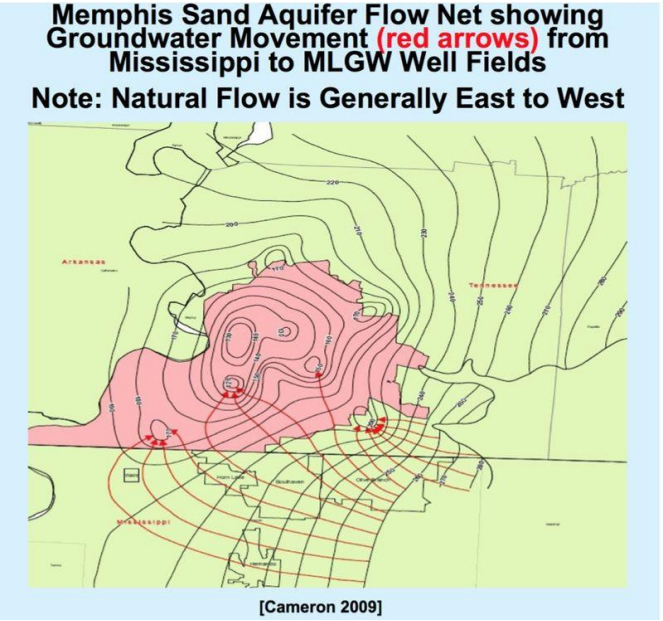


https://ars.els-cdn.com/content/image/1-s2.0-S1364815213003071-gr2.jpg

Allocation of water between states is subject to different laws

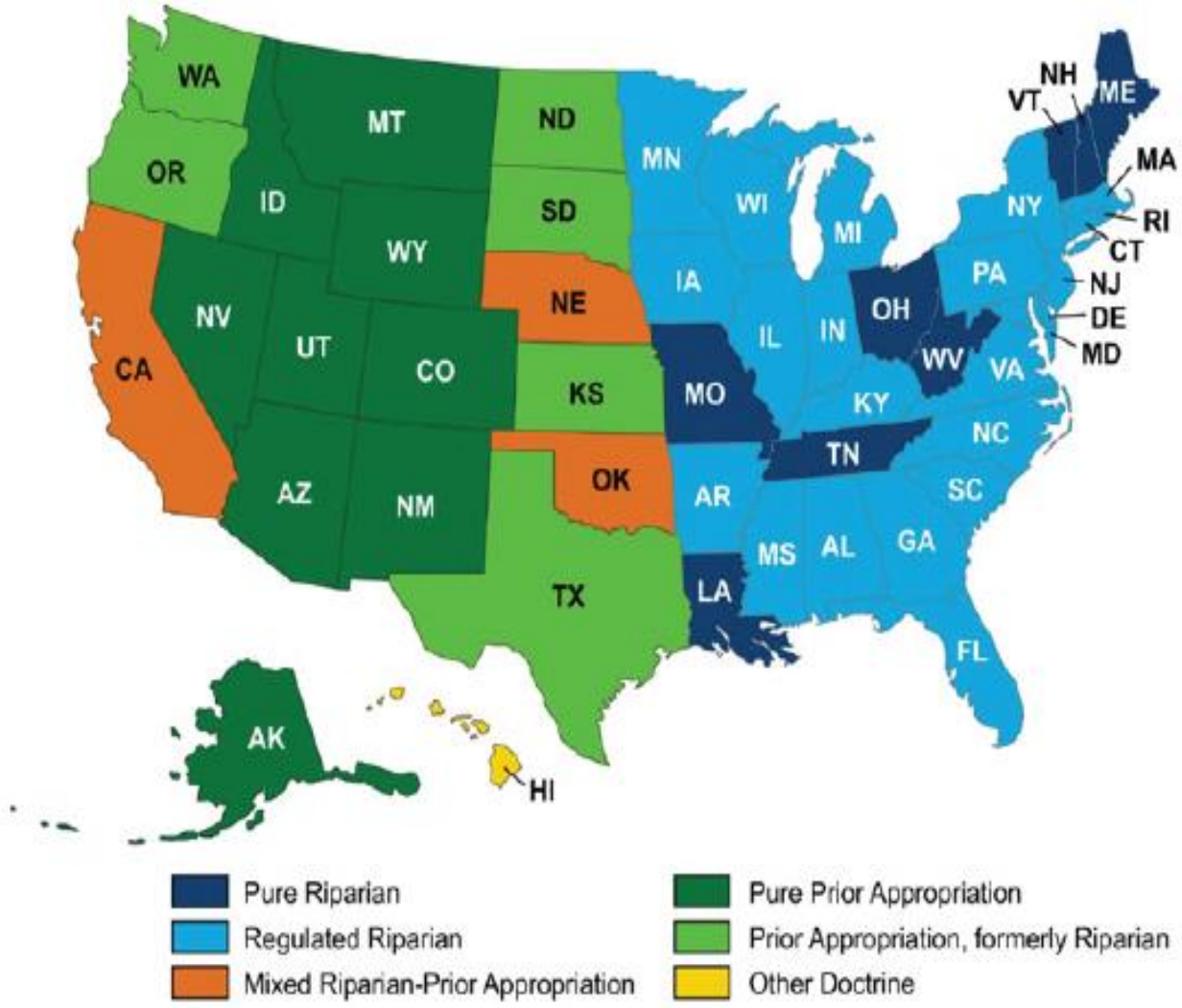
Surface water can be apportioned by U.S. Supreme Court (*equitable apportionment*), negotiated interstate compacts, or Congress

Groundwater allocation between states is a relatively new development, and formalized agreements for use between bordering states do not yet exist.



http://aquadoc.typepad.com/waterwired/2015/07/ms-gw.html

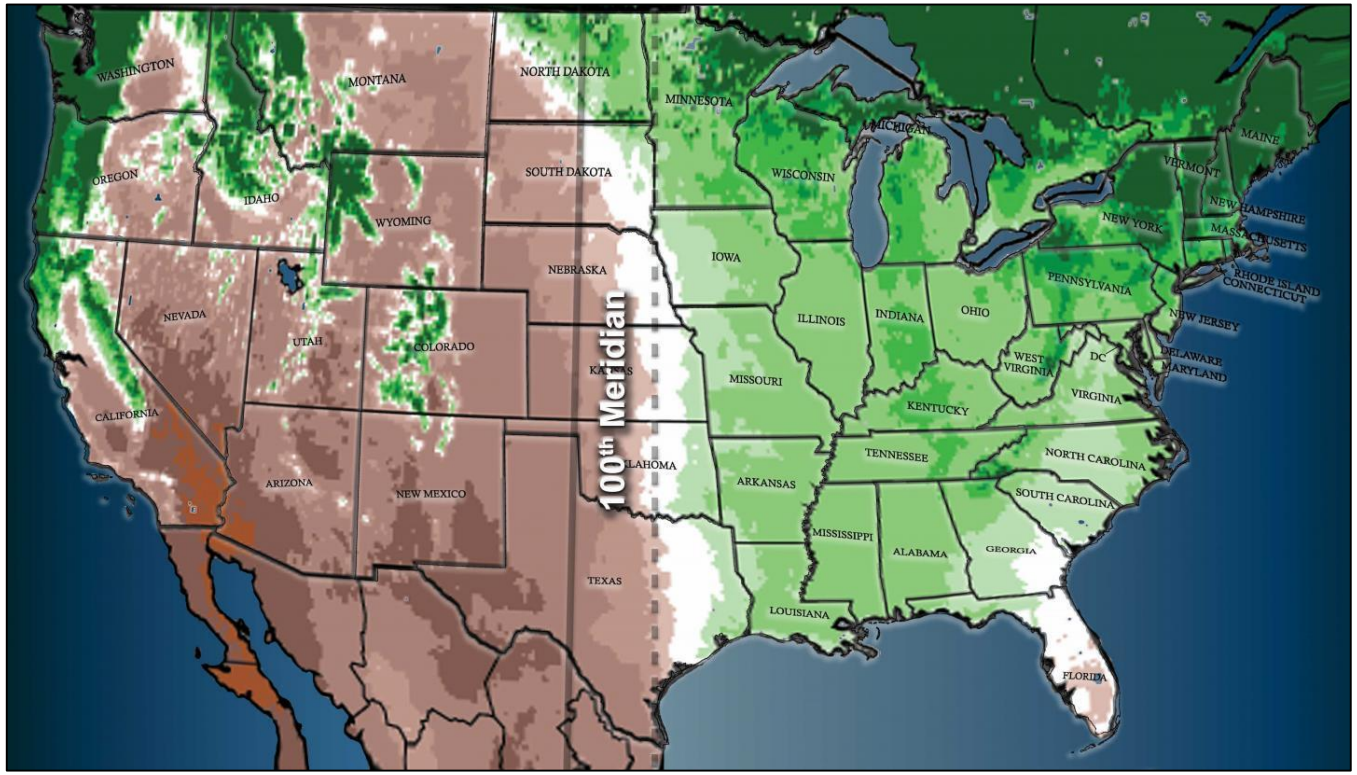
So where are we? 50 states, 50 systems of allocation (with differences for surface and groundwater, and between states)



Source: U.S. Dept. of Energy (2014)

3) Conditions on the ground are changing

“A North American Climate Boundary Has Shifted 140 Miles East Due to Global Warming”



https://e360.yale.edu/digest/a-north-american-climate-boundary-has-shifted-140-miles-east-due-to-global-warming

Irrigation along the eastern shore of Maryland & Delaware

http://www.delmarvanow.com/story/news/local/delaware/2014/07/02/drip-irrigation/12105845/

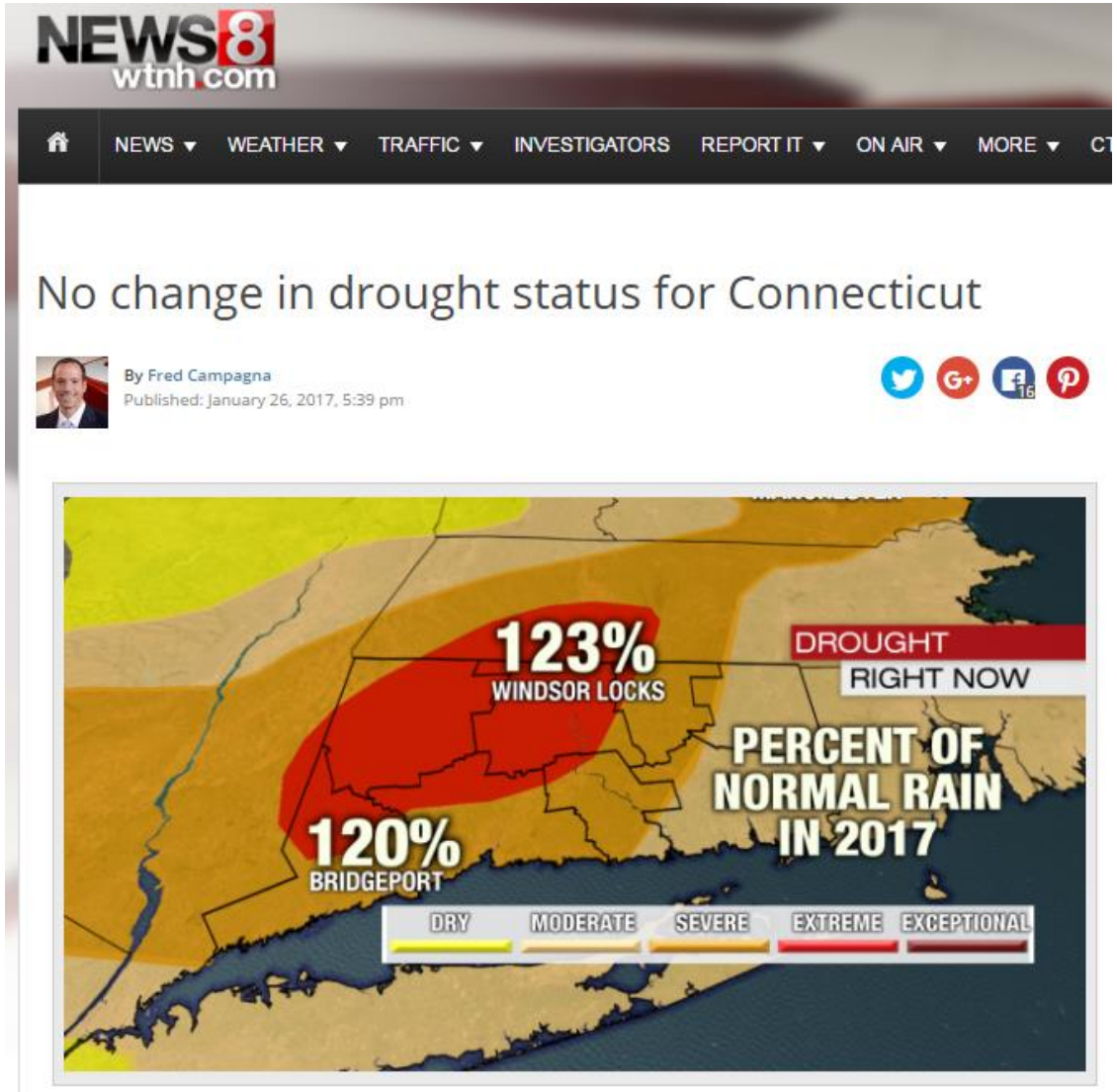
The challenge is adapting the law to account for what we know– and will come to know– about water resources and climate change

"If the body of law attached to water resources is antiquated, archaic, and incapable of flexible adaptation for modern needs, then economic technological and hydrological principles toward maximizing water use cannot be realized."

- Robert I. Reiss, *Connecticut Water Law: Judicial Allocation of Water Resources*, U. Conn., 1967

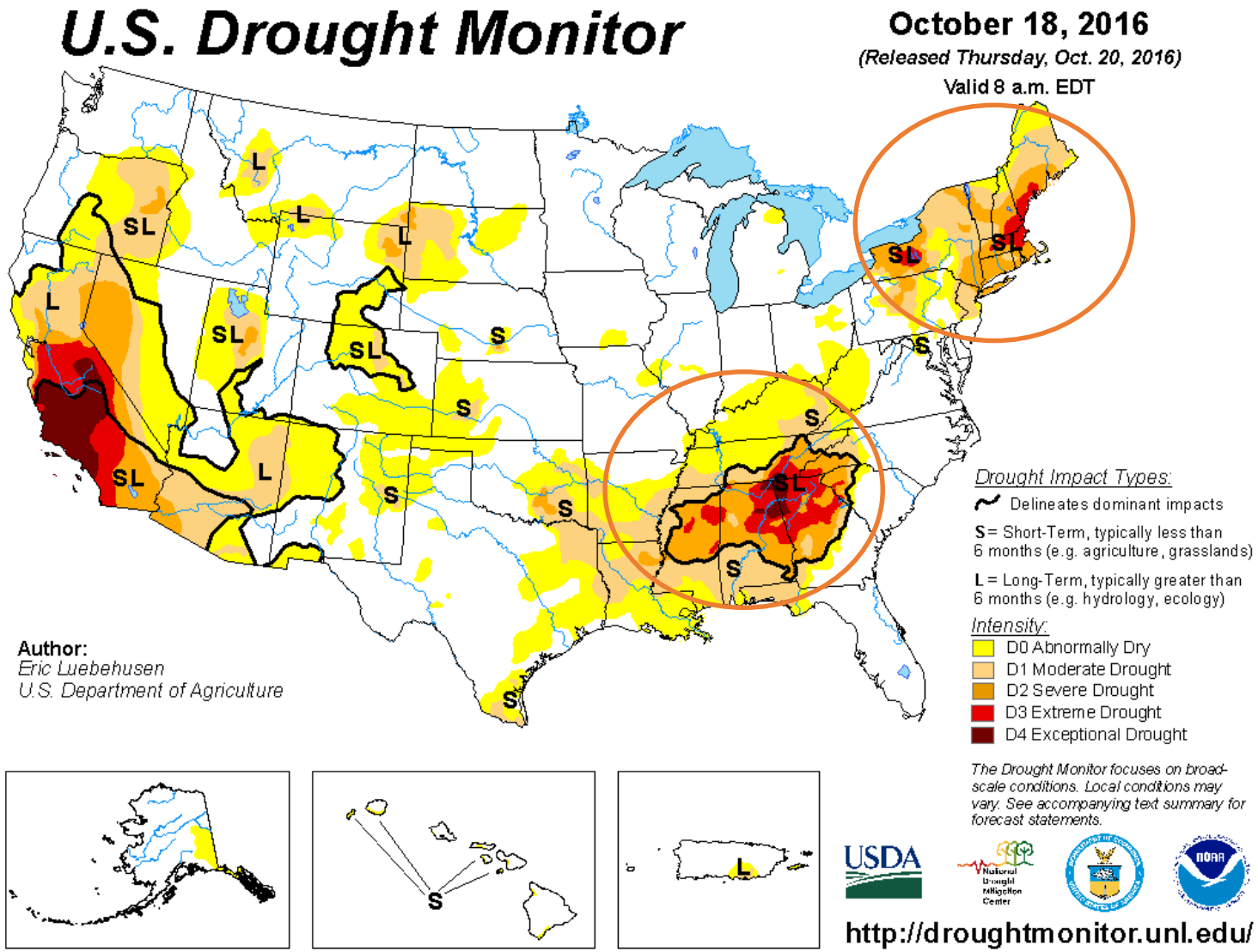
"Connecticut, like all the other New England States, lacks a statewide comprehensive water allocation policy to deal with the current water crisis."

- Kirk Mayland, Navigating the Murky Waters of Connecticut's Water Allocation Scheme, 24 Quinnepiac L. Rev. 685 (2010).

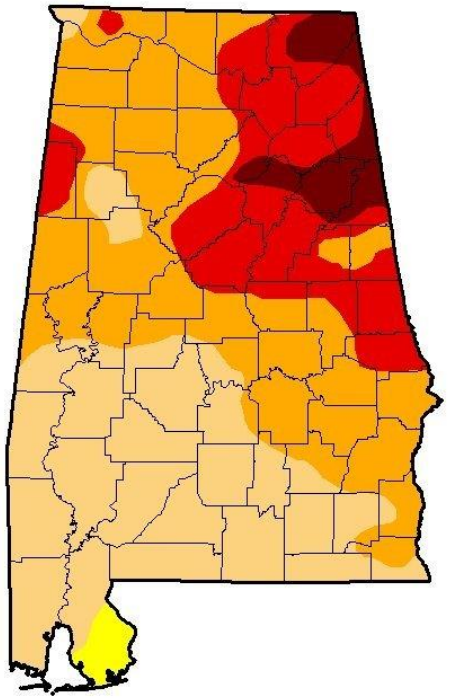


http://wtnh.com/2017/01/26/no-change-in-drought-status-for-connecticut/

Parts of the United States faced dry conditions or drought at the end of the 2016 growing season, not just in the areas you'd expect…



In October 2016, more than 98% of Alabama was in some kind of drought: “It’s epic. It’s really bad.”



October 18, 2016
(Released Thursday, Oct. 20, 2016)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	0.00	1.52	36.59	37.96	18.95	4.98
Last Week 10/11/2016	0.00	28.06	34.63	20.61	13.49	3.22
3 Months Ago 7/19/2016	37.02	21.44	26.94	11.87	2.72	0.00
Start of Calendar Year 12/29/2015	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year 9/27/2016	17.15	35.74	29.17	11.58	6.36	0.00
One Year Ago 10/20/2015	28.99	46.60	22.78	1.63	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

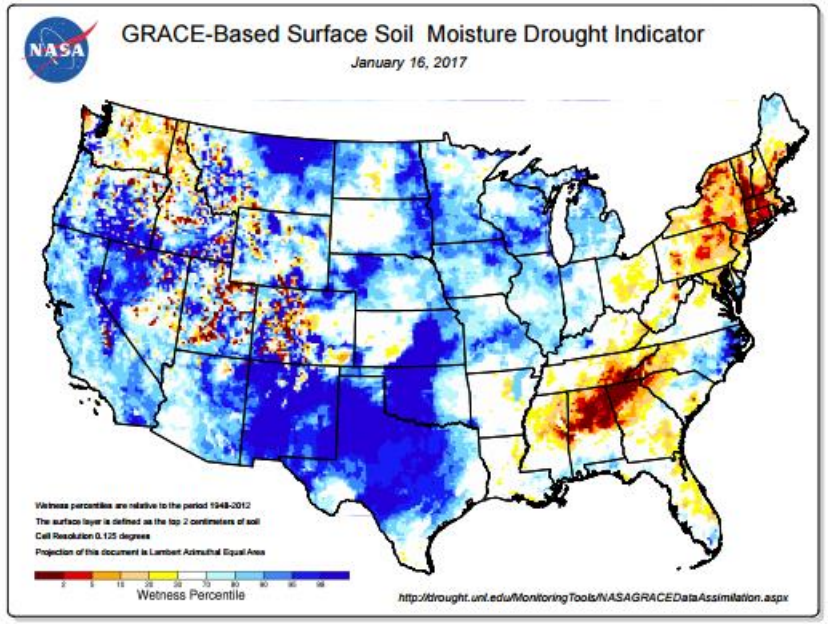
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

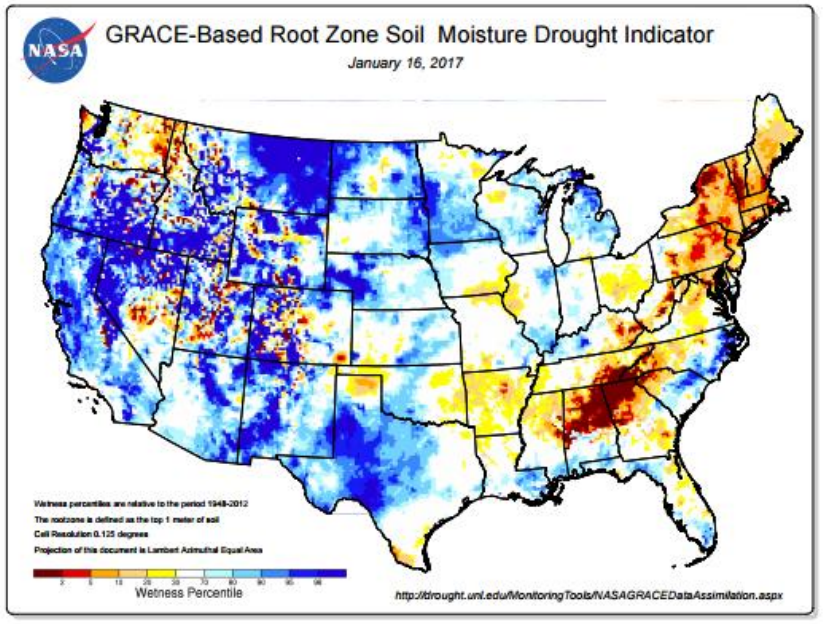
Author:
Eric Luebehusen
U.S. Department of Agriculture

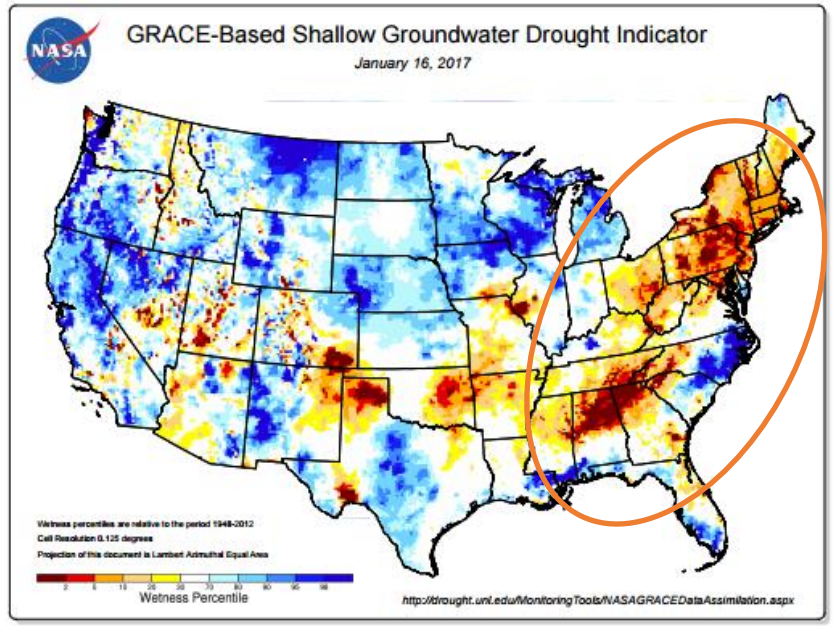
http://droughtmonitor.unl.edu/

http://www.al.com/news/huntsville/index.ssf/2016/10/at_ground_zero_of_alabamas_dro.html

Drought in the east remained an issue into Jan. 2017: in soil moisture levels, in root zones, and in shallow aquifers

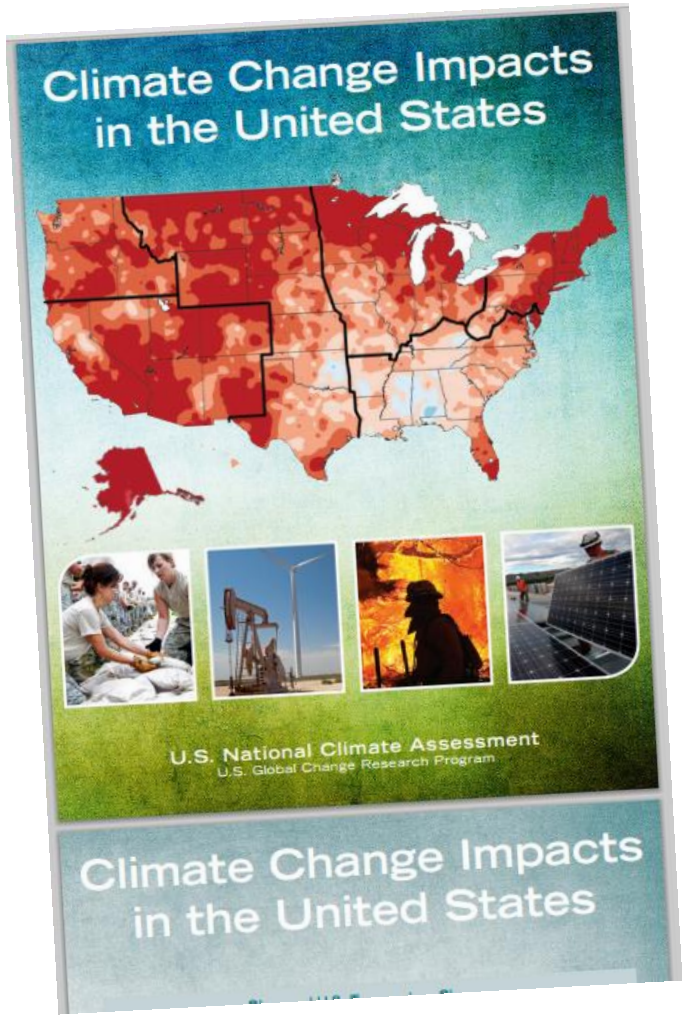






http://drought.unl.edu/MonitoringTools/NASAGRACEDataAssimilation.aspx

Predictions for the Northeast (including the mid-Atlantic) are for more floods, and more winter precipitation



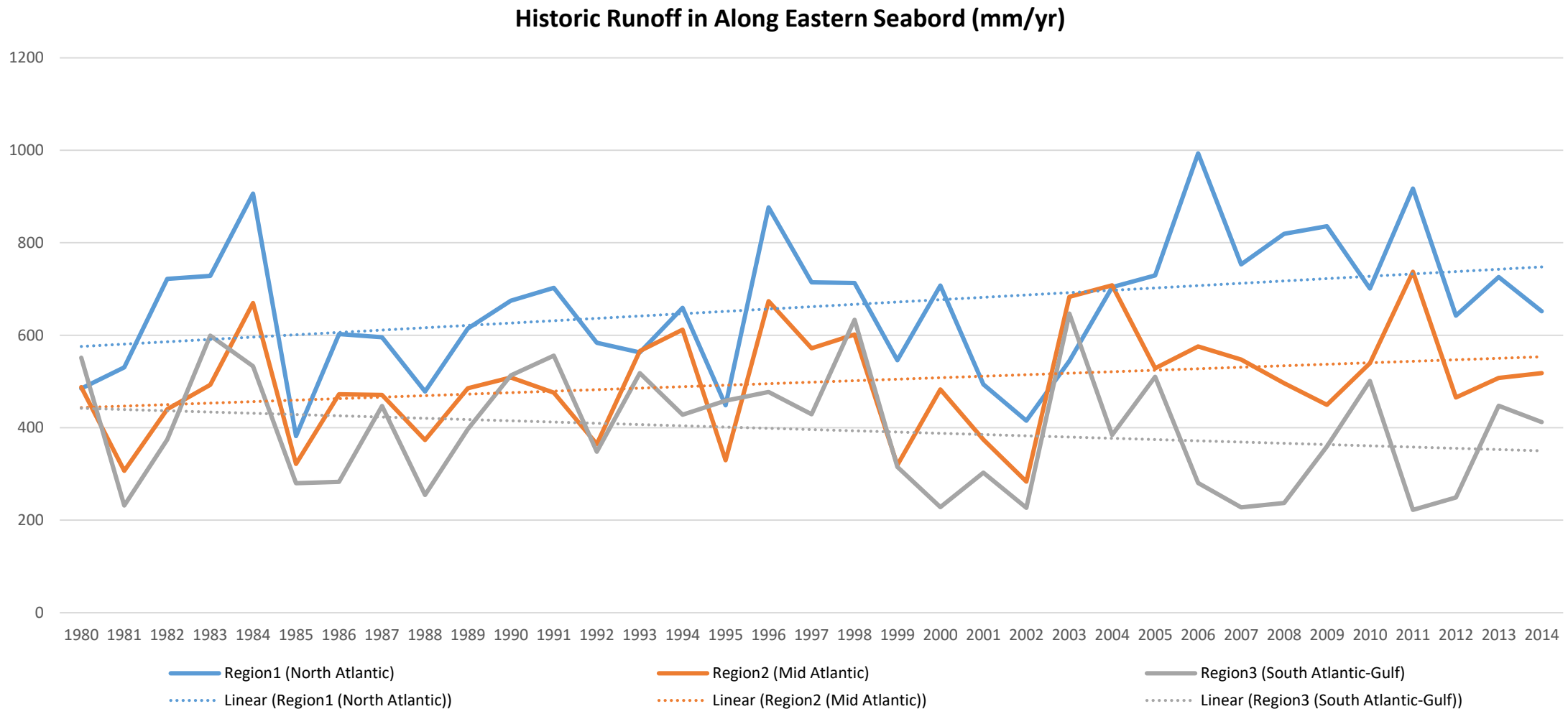
16 NORTHEAST

Key Messages

1. Heat waves, coastal flooding, and river flooding will pose a growing challenge to the region's environmental, social, and economic systems. This will increase the vulnerability of the region's residents, especially its most disadvantaged populations.
2. Infrastructure will be increasingly compromised by climate-related hazards, including sea level rise, coastal flooding, and intense precipitation events.
3. Agriculture, fisheries, and ecosystems will be increasingly compromised over the next century by climate change impacts. Farmers can explore new crop options, but these adaptations are not cost- or risk-free. Moreover, adaptive capacity, which varies throughout the region, could be overwhelmed by a changing climate.
4. While a majority of states and a rapidly growing number of municipalities have begun to incorporate the risk of climate change into their planning activities, implementation of adaptation measures is still at early stages.

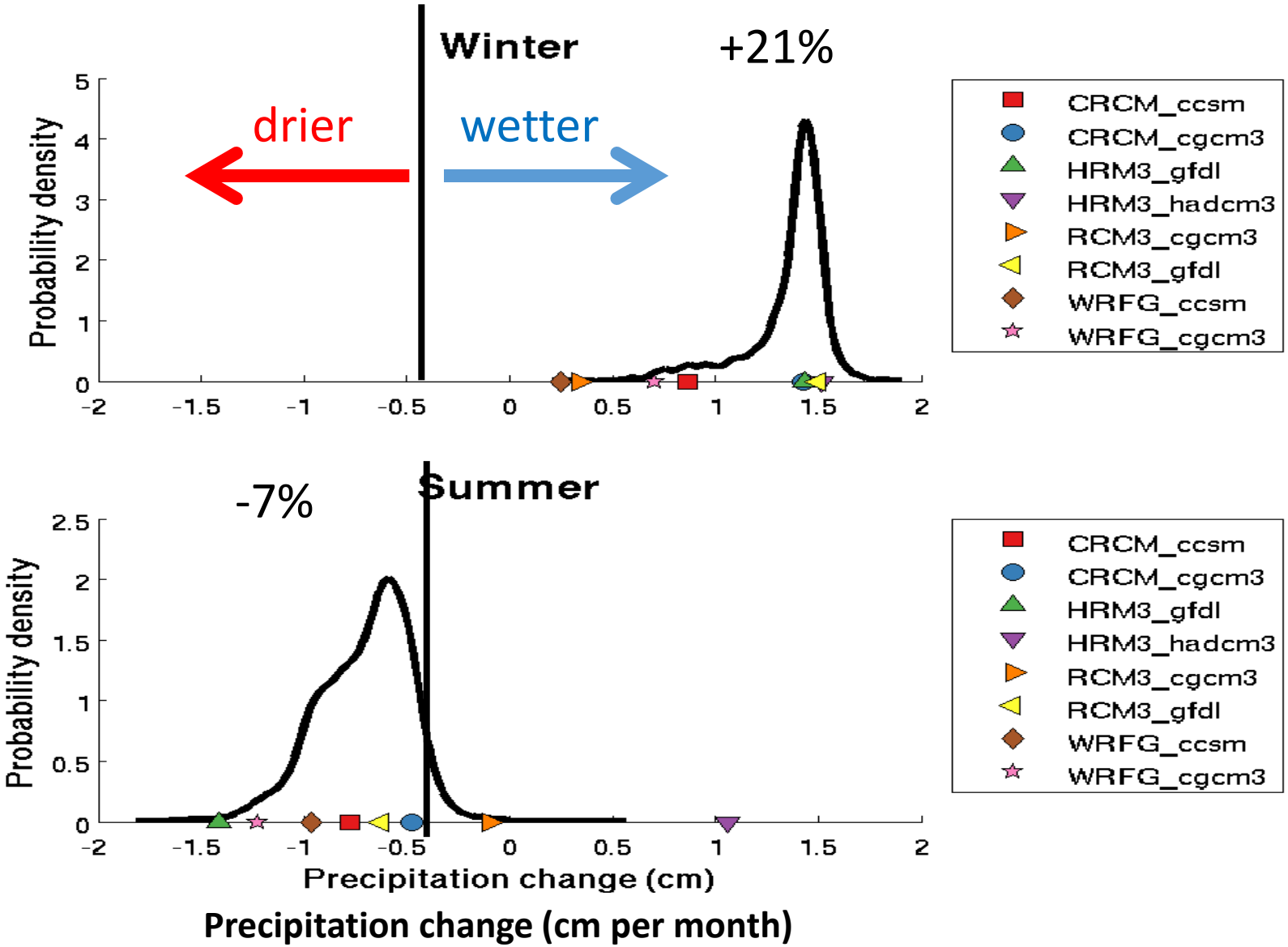
http://nca2014.globalchange.gov/

Real changes are already being seen: overall runoff in the northern and mid-Atlantic U.S. is increasing



Source: USGS WaterWatch (Past Flow/Runoff / Annual Summaries by State) at http://waterwatch.usgs.gov/index.php?id=statesum

However, the impact of drought in the summer remains a concern



Ross et al. (2014)

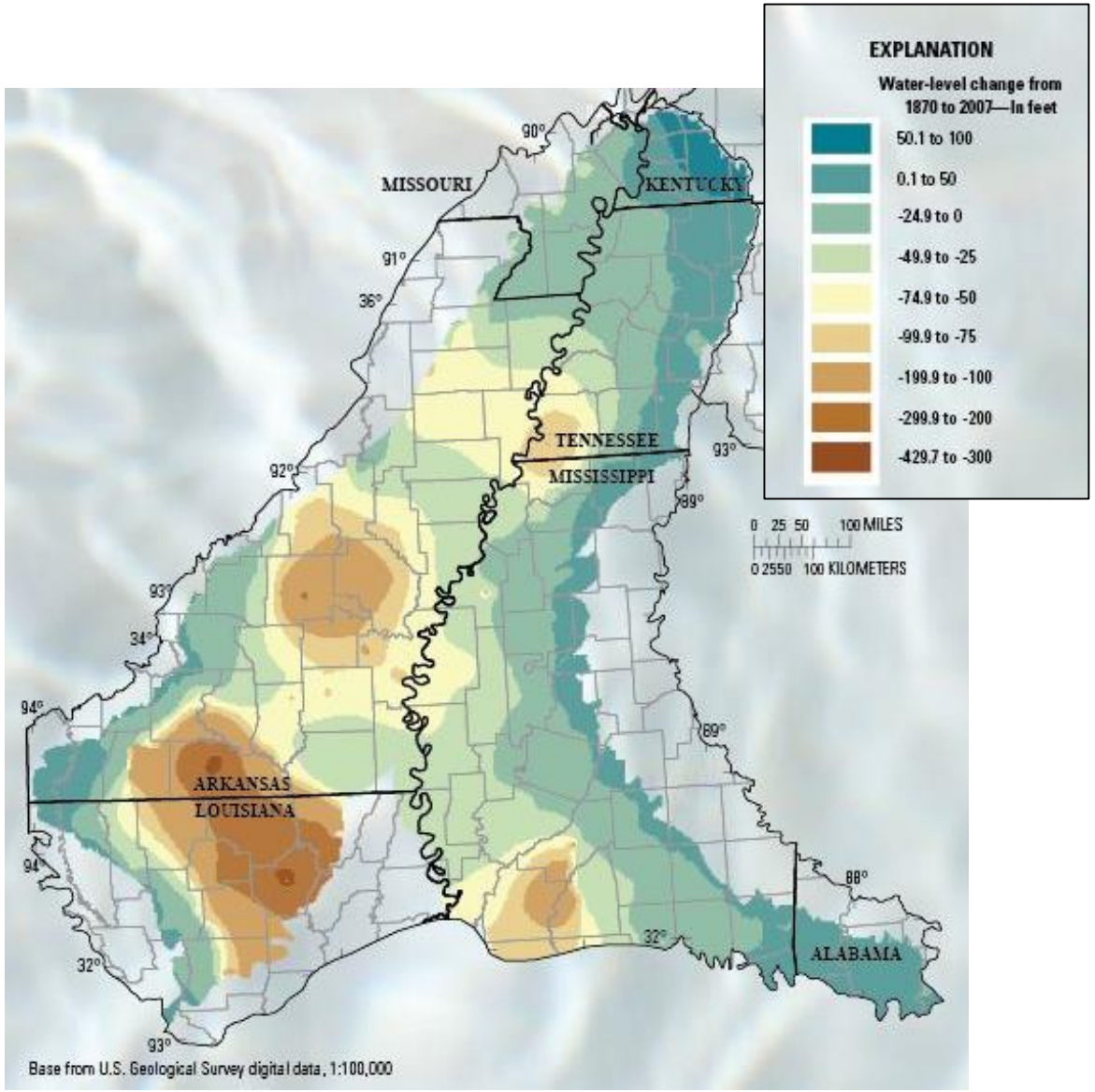
The Midwest and the Mississippi River Valley are also experiencing shortages, and more irrigation

"Wisconsin Groundwater Dispute Is a Warning Signal for the Eastern United States"
October 26, 2015

"[Iowa] State regulators approve new rule for Jordan Aquifer water supply"
June 17, 2015

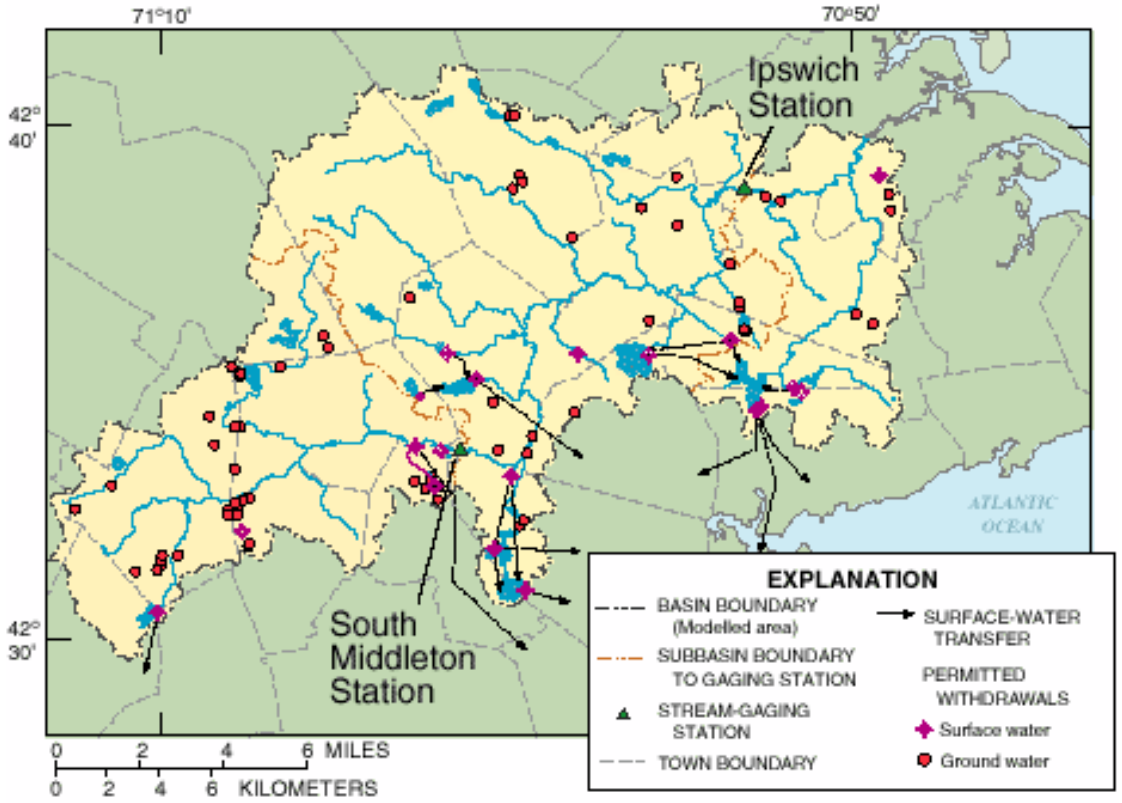
"The alluvial aquifers adjacent to the Mississippi River, of which Arkansas is the biggest user, have been depleted by 26 percent. Most of that depletion occurred in the last 35 years." (Arkansas is now in the top 15 irrigated states, along with Georgia, Mississippi, Missouri, and Florida)

Mississippi is suing Tennessee in the US Supreme Court in the 1st equitable apportionment case re: groundwater: http://www.ca6.uscourts.gov/special-master



Water level change from 1870 to 2007 in the Mississippi River Valley Alluvial Aquifer

Ground and surface water withdrawals also significantly impact local ecology and fisheries in places like Massachusetts' Ipswich River Basin



http://pubs.usgs.gov/fs/fs-160-00/

http://ipswichriver.org/wp-content/uploads/2012/03/22580021.jpg

Increasing groundwater withdrawals are creating water shortages in areas generally thought of as water-rich

Suffolk News-Herald

Since 1873

Groundwater reductions proposed

Published 9:04pm Thursday, October 22, 2015

groundwater per month
Environmental Quality.

However, the permits are

"It's kind of like the difference between having a steady job where you get a paycheck every week ... and being a consultant where you may have feast or famine in your cash flow," said Pat Bresnahan, former associate director of the University of Connecticut's Water Resources Institute. "With climate change it might be something very similar."

"Groundwater levels are decreasing," Moo
We have a vested interest in this so we can use it in

DEQ has announced its intent to reduce permitted amounts for perm
the renewal process, which includes the local water authority.

Tidewater Water Authority is permitted to draw 8.34 million gallons per day but draws only about 3.51 million gallons per day, Moor said.

"Groundwater levels are decreasing," Moor said. "The sustainability of this is key. We have a vested interest in this so we can use it in the future."

the ct mirror

Politics Health Care Budget/Economy Schools/Child Welfare Enviror

Water shortages come home to Connecticut

By: NEENA SATIJA | February 12, 2013

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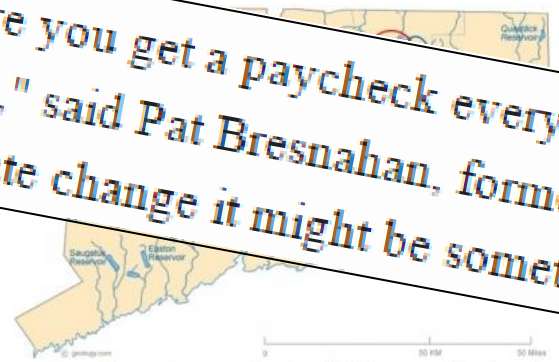
The controversy over the University of Connecticut's proposals to quench its thirst shows that water isn't just the Southwestern states' problem anymore.

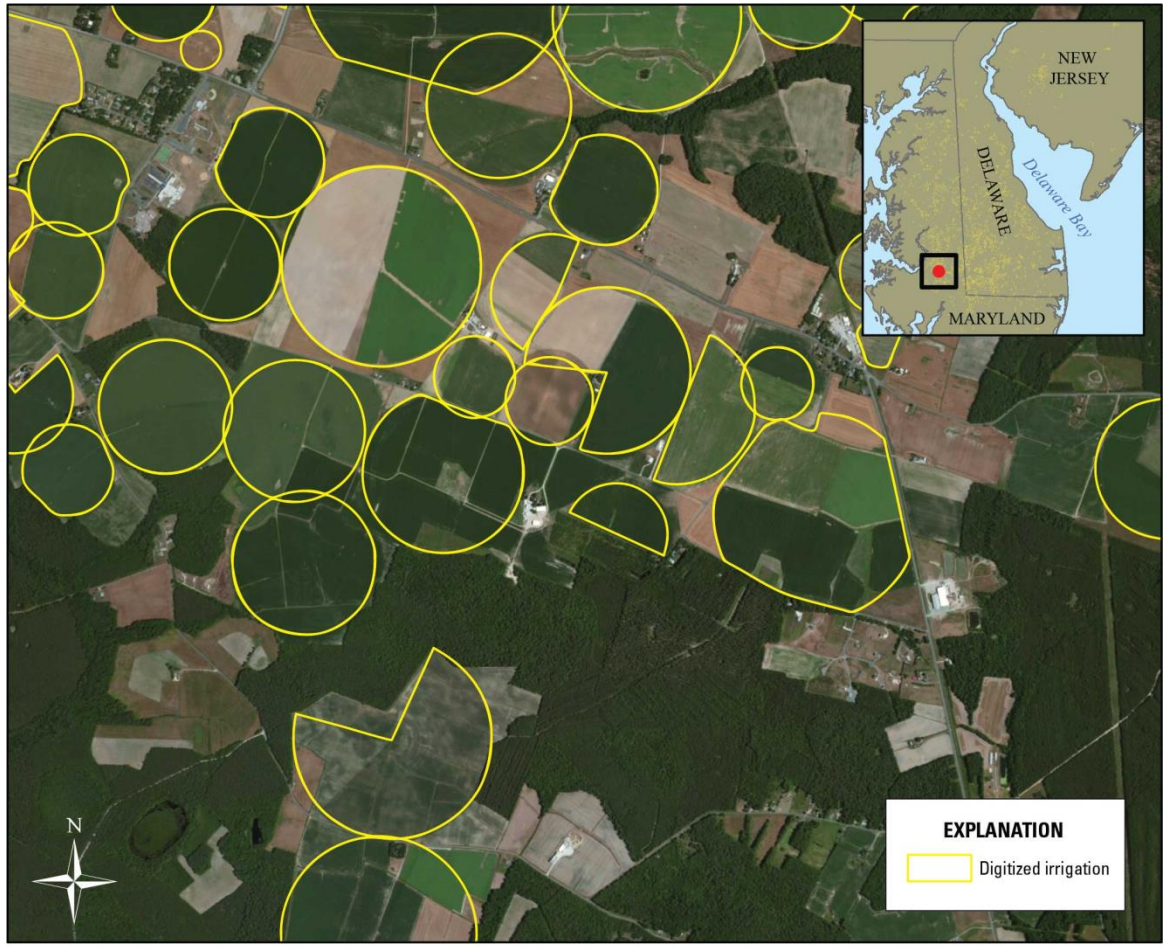
The Northeast has often been seen as a water-rich part of the country and, in fact, the amount of rainfall in Connecticut has actually increased slightly in the last century. But weather patterns have become more erratic: In recent years, for instance, we've seen wetter winters, but drier summers. The historic blizzard that Connecticut is still digging out from this week is a perfect example.



State map shows the reservoirs that might be tapped into based on proposals from the University of Connecti... from Virginia de Lima, chief of the U.S. Geological Survey's Connecticut office. The blue circle is where UConn discharges water.

"It's kind of like the difference between having a steady job where you get a paycheck every week ... and being a consultant where you may have feast or famine in your cash flow," said Pat Bresnahan, former associate director of the University of Connecticut's Water Resources Institute. "With climate change it might be something very similar."

People are adapting to changing patterns of precipitation; one Delaware County added ~18,000 new acres of irrigation from ‘07- ‘12



http://pubs.usgs.gov/ds/0932/report.html

Figure 3. Digital map results for a portion of Dorchester County, Maryland.

Irrigation along the eastern shore of Maryland & Delaware

Photo: http://www.delmarvanow.com/story/news/local/delaware/2014/07/02/drip-irrigation/12105845/

In reacting to these issues, common law riparianism has become increasingly regulated (regulated riparianism), with a public trust overlay

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VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Guidance

Virginia Department of Environmental Quality
P.O. Box 1105
Richmond, VA 23218

Contact Us:
1-(804) 698-4000
1-800-592-5482 (Toll Free in VA)

View Department of Environmental Quality Expenses

Water Laws, Regulations & Guidance

Laws

As of July 1, 2013, the State Water Control Law (§62.1-44.2 et seq) incorporates the Chesapeake Bay Preservation Act (§62.1-44.15:67 et seq), the Erosion and Sediment Control Law (§62.1-44.15:51 et seq) and the Virginia Stormwater Management Act (§62.1-44.15:24 et seq) under the jurisdiction of the State Water Control Board. Please consult our statutory crosswalk document for a listing of changes in the numbering system.

[NOTE: The published and online versions of the Code of Virginia currently state that the State Water Control Law sections referenced above have a "contingent effective date." Please be advised that the contingency was removed on July 2, 2013, when the U.S. Environmental Protection Agency (EPA) approved rescission of authorization for delegation of program authority to the Virginia Soil and Water Conservation Board. Further, as a result of the EPA action, the companion repeal of sections in Title 10.1 also became effective.]

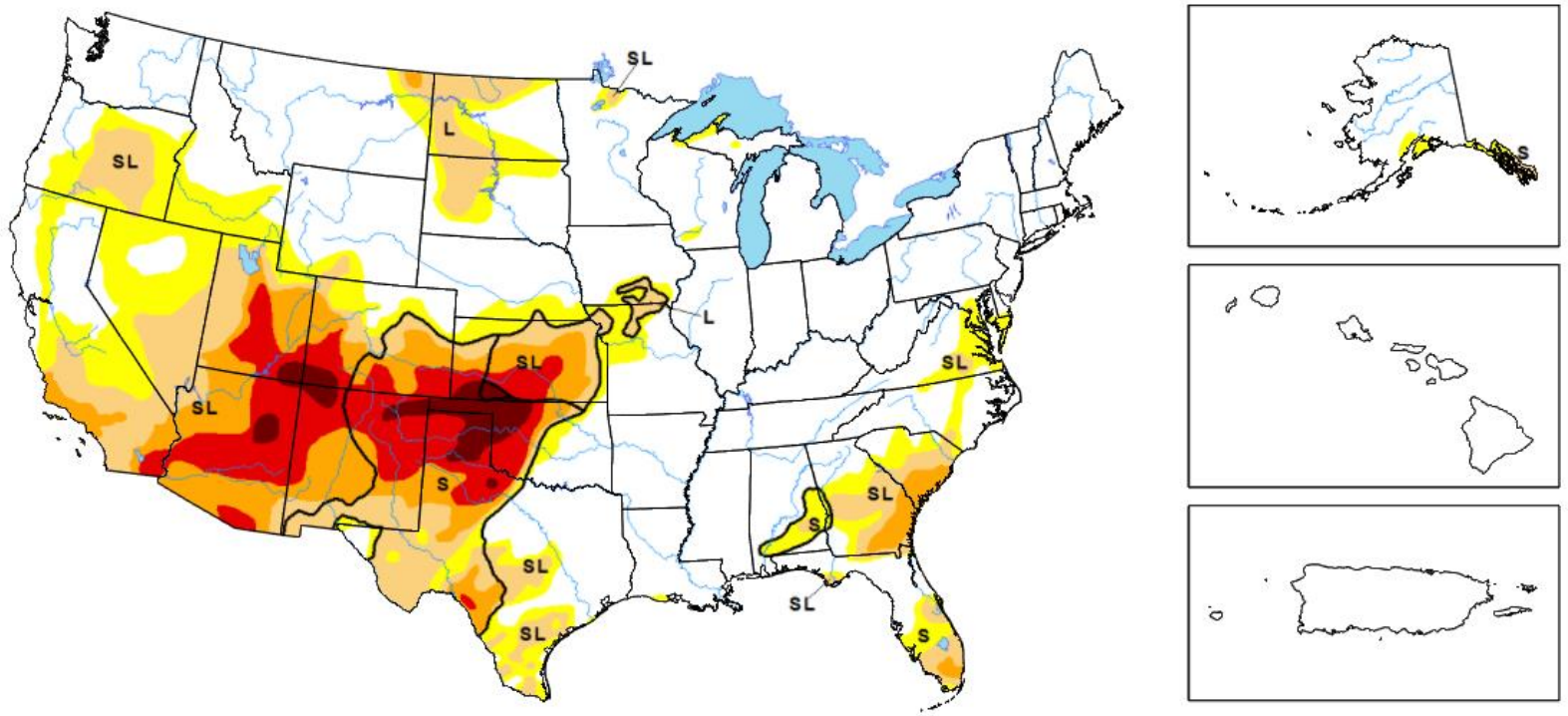
DEQ is authorized to implement a variety of laws and regulations pertaining to water quality and supply.

The U.S. Environmental Protection Agency (EPA) under the federal Clean Water Act enables states to implement certain EPA responsibilities. One of these responsibilities is the authority to issue National Pollutant Discharge Elimination System permits. EPA has authorized Virginia to issue NPDES permits under the Virginia Pollutant

The western U.S. is also facing huge stress on water availability for all uses

Map for April 19, 2018

Data valid: April 17, 2018 | Author: Brad Rippey, U.S. Department of Agriculture



The data cutoff for Drought Monitor maps is each Tuesday at 8 a.m. EDT. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

Intensity and Impacts

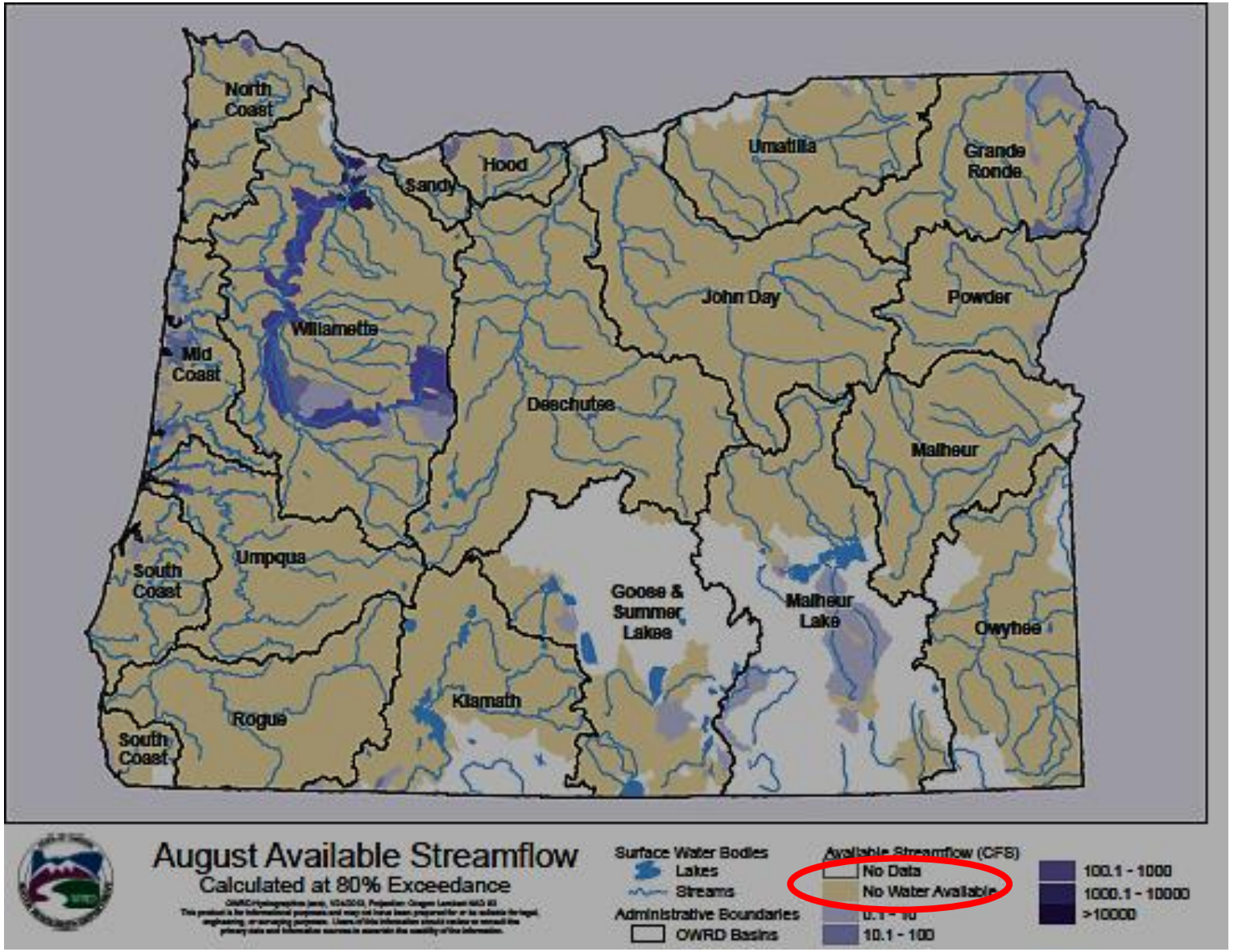
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

~ - Delineates dominant impacts

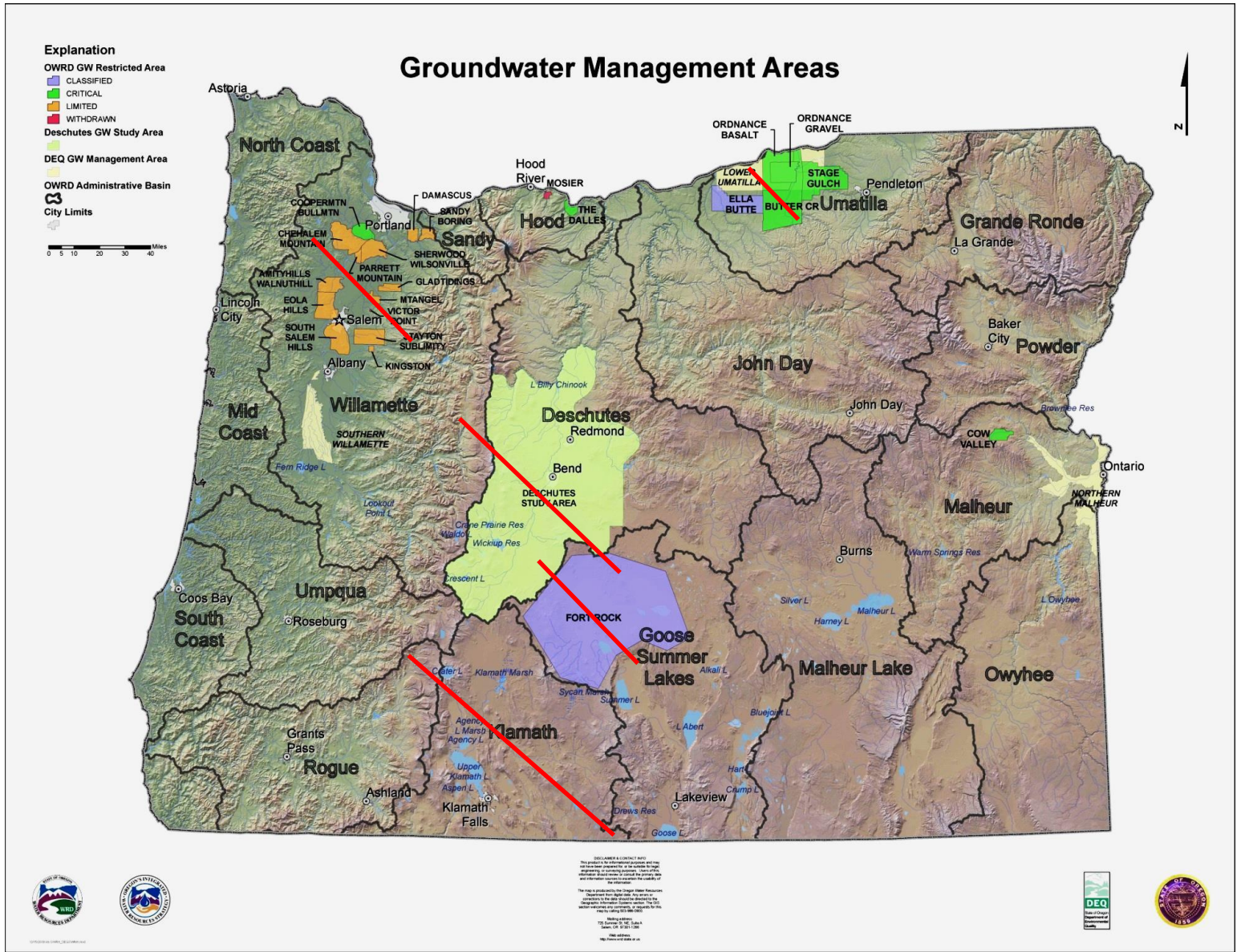
S - Short-Term impacts, typically less than 6 months (e.g. agriculture, grasslands)

L - Long-Term impacts, typically greater than 6 months (e.g. hydrology, ecology)

Surface water is not available for further appropriation in many western states

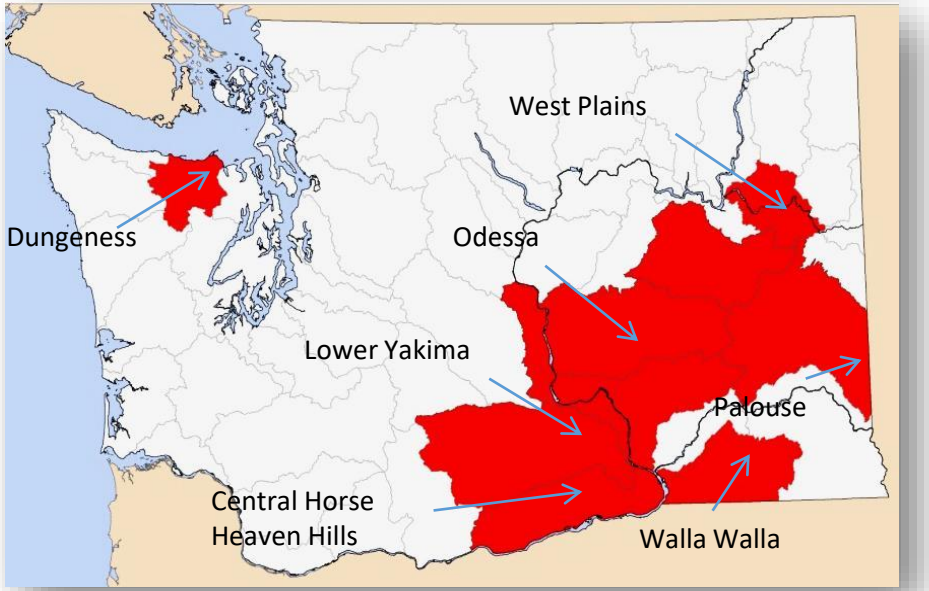


Lack of availability is also impacting access to groundwater



Groundwater impacts in Washington State

- Groundwater → critical role in economic and environmental future:
  - *Drinking water* for 60%+ of WA residents; more in the future will rely on groundwater
  - *Irrigation supply* for over 400,000 acres
  - *Commercial and industrial needs* -- 237 million gallons per day for livestock, aquaculture, industrial and mining uses
- Groundwater being used faster than it is naturally replenished
  - For example, groundwater levels of the Columbia Plateau system show marked declines in the past 25 years in more than 80% of nearly 500 wells measured



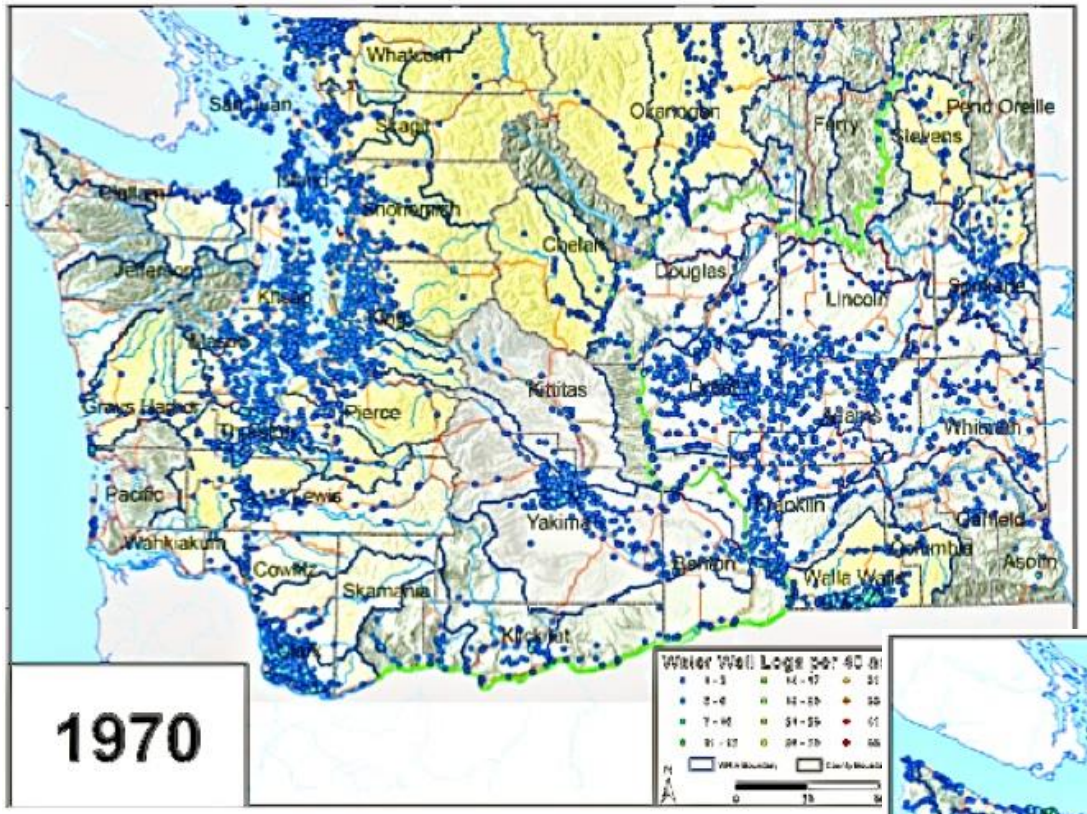
Watersheds with significant groundwater declines

Slide from Washington State Dept. of Ecology

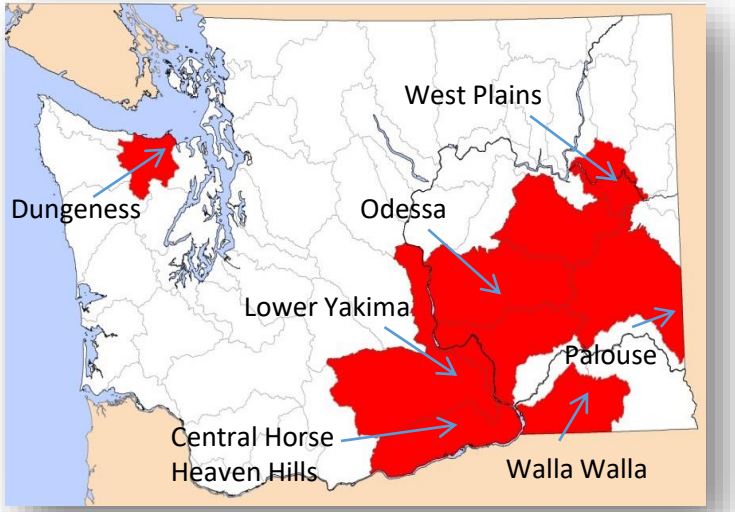
Exemptions under law are also causing impacts

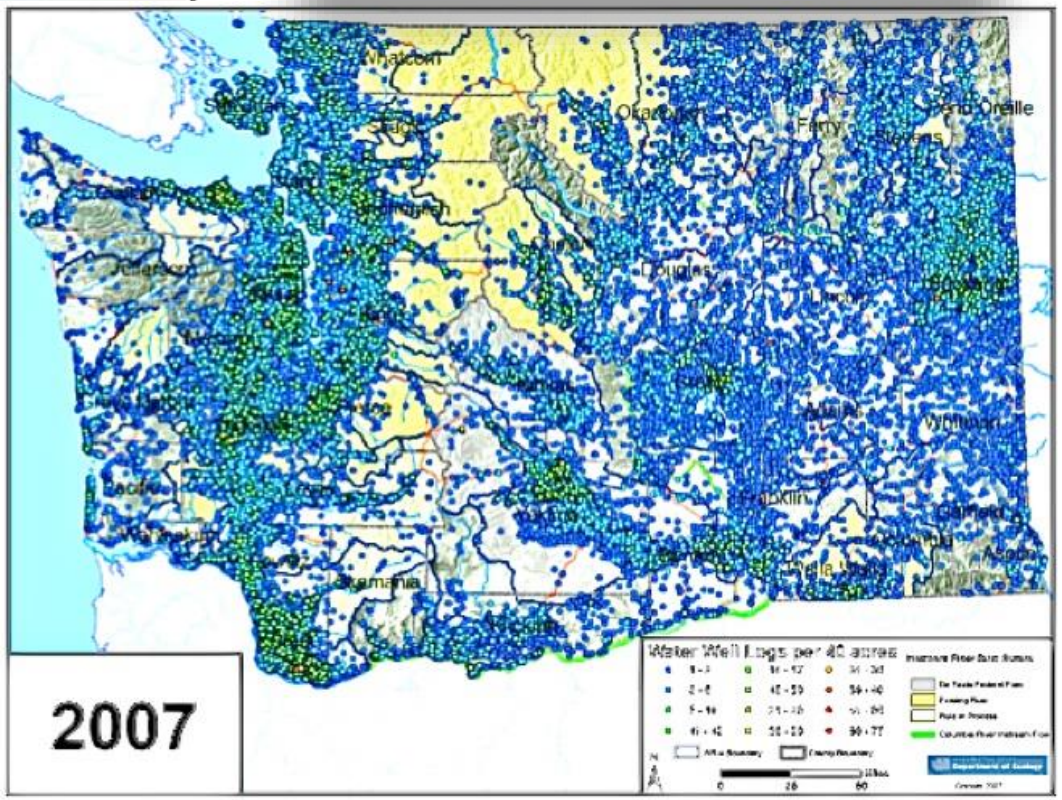
- Oregon (ORS 537.545)
  - Stock watering
  - Lawn or noncommercial garden (up to ½ acre)
  - Single/ group domestic use (up to 15,000 gpd)
  - Industrial/commercial use (up to 5,000 gpd)
  - Down-hole heat exchange uses
  - School grounds in critical ground water area (10 acres or less).
- Washington (RCW 90.44.050)
  - Stock watering (no limit- see *Easterday Ranch* decision)
  - Non-commercial lawn or garden (reasonable use for up to ½ acre)
  - Single/group homes (up to 5,000 gpd)
  - Industrial purposes, including irrigation (up to 5,000 gpd but no acre limit)

- Exemption
  - From state water right required for groundwater development
  - NOT an exemption from well construction/maintenance/abandonment standards
    - RCW 18.104, WAC 173-160
    - ORS 537.535-537.595, OAR 690-200 to 690-230
  - Subject to “beneficial purpose without waste”
- Significant numbers drilled each year
  - For example, there are more than ~7,000 new wells/year in Washington State



Watersheds with significant groundwater declines

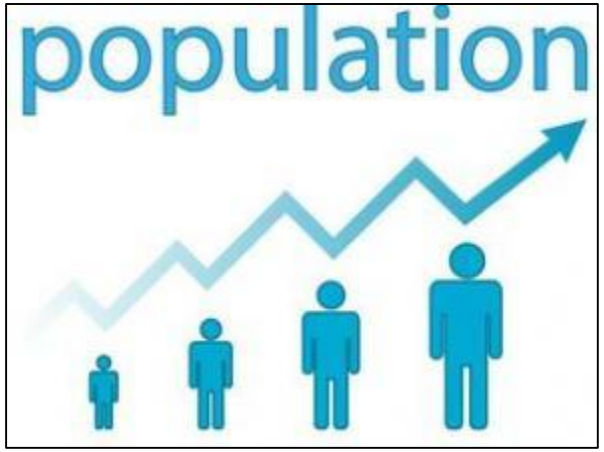




http://www.celp.org/exemptwells/overview.html

Pacific Northwestern states are facing a growing number of challenges with respect to water resources management

http://investcanopy.com/wp-content/uploads/2015/12/Salmon-spawning.jpg



https://static1.squarespace.com/static/513788d5e4b0988e47dbf980/t/5925c1126a4963604192adbc/1495646505176/

https://engage.gov.bc.ca/app/uploads/sites/6/2017/04/5231_EngagementBanner_1200x600px_ColumbiaRiverTreaty.jpg

http://aemstatic-ww1.azureedge.net/content/dam/hydroworld/print-articles/Volume%2034/Issue%206/Portland-District_130308_011.jpg

https://www.interest.co.nz/sites/default/files/styles/inline_large/public/feature_images/Population%20pic.JPG?itok=bnnpdNX8

Other factors, such as tribal water rights and changing hydrological conditions, (drought, flooding, weather variability) impact policy

https://www.doi.gov/sites/doi.gov/files/styles/gallery_photo_full/public/photos/1113.jpg?itok=NT90CySn; Crow Tribe Compact in Montana (2016)

Chehalis River Basin; Bruce Ely, The Oregonian, 2007

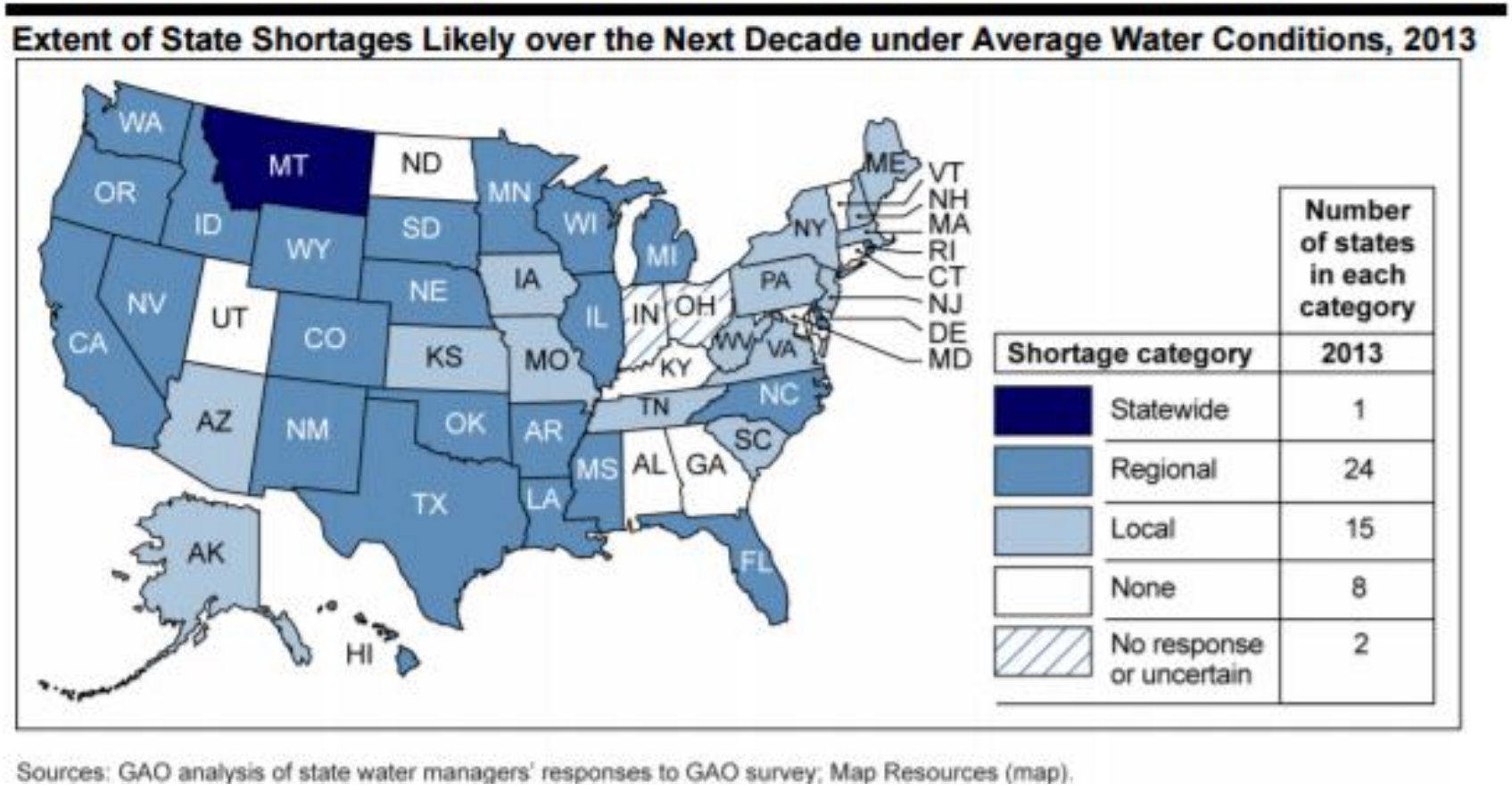
The Government Accountability Office found that state governments are making significant efforts to understand and better manage freshwater resources

Studies and Assessment

Conservation Efforts

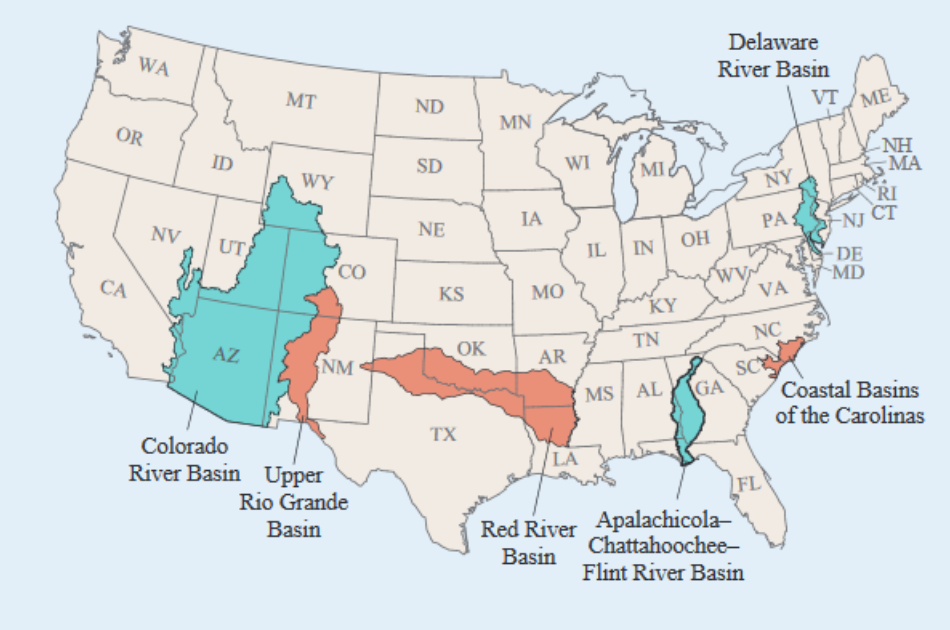
Drought Preparedness Plans

Climate Change Planning



http://www.gao.gov/products/GAO-14-430

Collaborative, long-term water resource planning is a rational answer, and Federal initiatives have focused on providing support



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

NIDIS

Drought.gov

U.S. Drought Portal

USGS: National Water Census

- Authorized by the 2009 SECURE Water Act (Public Law 111-11)
- USGS Core Science Directive for 2007-017

https://pubs.usgs.gov/fs/2015/3045/pdf/fs2015-3045.pdf

National Drought Resilience Partnership

- NOAA, USDA, EPA, ACE, and others

Mississippi Basin Healthy Watersheds Initiative

- USDA and 13 states

Effective regulation in the face of uncertainty and variability is challenging; changes create both more challenges, and opportunities

Challenges	If changes made, more challenges	Opportunities
Vested interests/rights in existing system (over-allocation?)	Risk of creating new vested interests	Gather information
Law & science don't match	Increased documentation = Increased regulation?	Permits with reopeners/adaptation
Data issues: lack or gaps, non-comparable, private	Privacy concerns	Adaptive Management
Changing climate & increasing variability	Difficulty of managing uncertainty	Coordination of effort
Legacy issues (acid mine drainage, old mill ponds)	Funding	Expansion of Environmental Review

Yet we must find a way to manage these types of issues, or the issue will make its way to the courts

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Tri-State Water Wars: 25 Years of Litigation between Alabama, Florida and Georgia

Two river basins supply water to metropolitan Atlanta—the Apalachicola-Chattahoochee-Flint (ACF) River Basin (Georgia, Florida, and A
the ACF Basin, some me
withdraw their water fr
Marietta Water Authorit
from the Etowah River b
ability store water in La
and businesses in the me

The ACF and ACT Basins have been immersed in litigation for over two decades. The first round of cases (from 1990 to 2012) involved 8 separate cases in six different district courts, all challenging various aspects of the U.S. Army

UNITED STATES COURT OF APPEALS
for the Sixth Circuit
R. Guy Cole, Jr., Chief Judge

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Special Master

Mississippi v. Tennessee; City of Memphis, Tennessee; and Memphis Light, Gas & Water Division, No. 143, Original

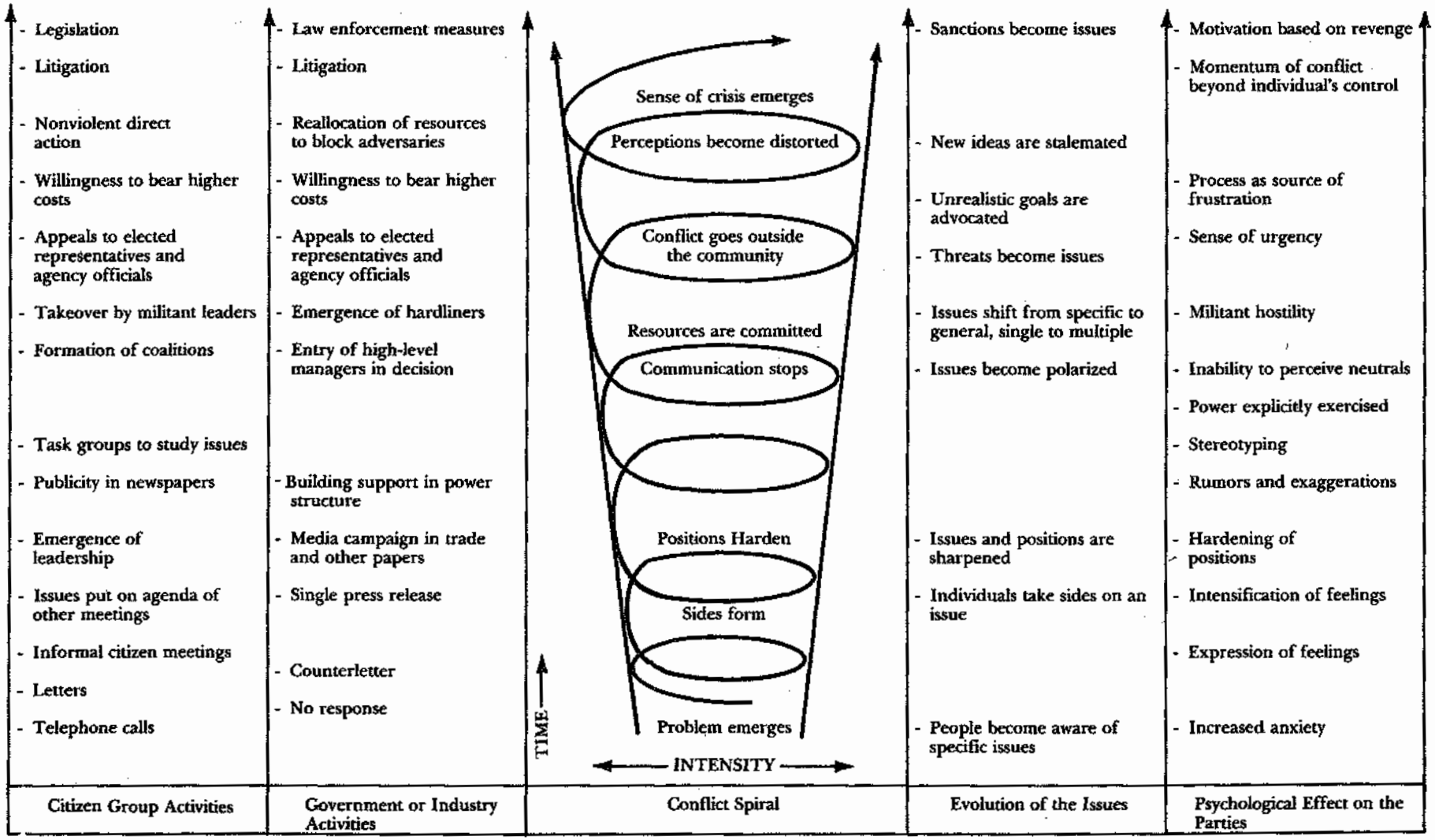
The official docket sheet for this case, as maintained by the Clerk of the Supreme Court of the United States, is available online. The official docket sheet does not contain entries for papers filed directly with the Special Master. The Special Master has prepared the following docket sheet which includes all filings made with or by the Special Master, in ".pdf" format.

Hon. Eugene E. Siler, Special Master

One solution: watershed based approaches
How do you “fix” this kind of flooding? Chehalis River, Washington, Dec. 2007

Bruce Ely, The Oregonian

Figure 1. Spiral of Unmanaged Conflict.



Carpenter & Kennedy, Managing Public Disputes, pg. 12

The New York Times

Anger and Blame After Deadly Flood in Northwest

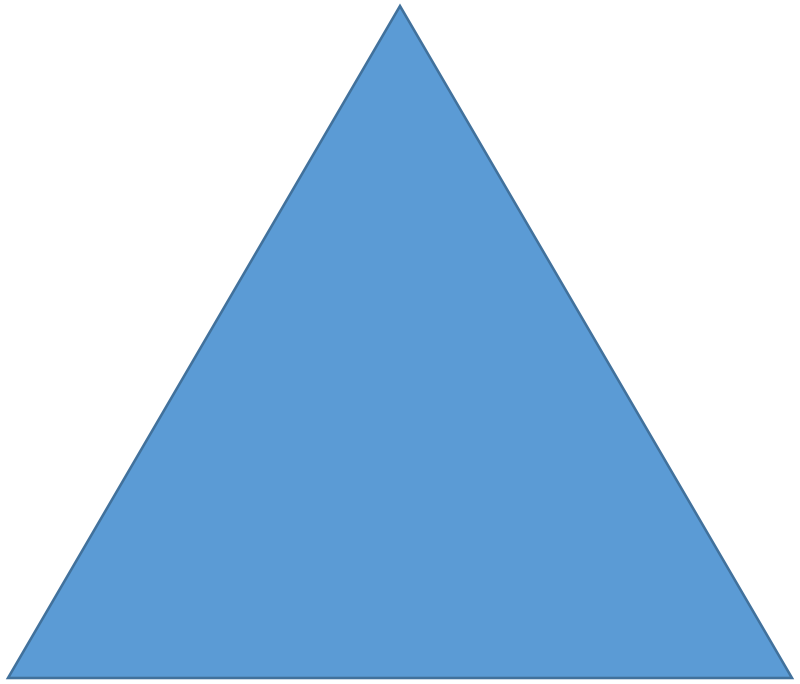
By WILLIAM YARDLEY JAN. 3, 2008

Areas of mudslides are visible along recently logged steep slopes that drain into a tributary of the Chehalis River.
Steve Ringman/The Seattle Times

http://www.nytimes.com/2008/01/03/us/03flood.html?_r=0

Conflict may arise about the substance, but often is really related to the people or the process

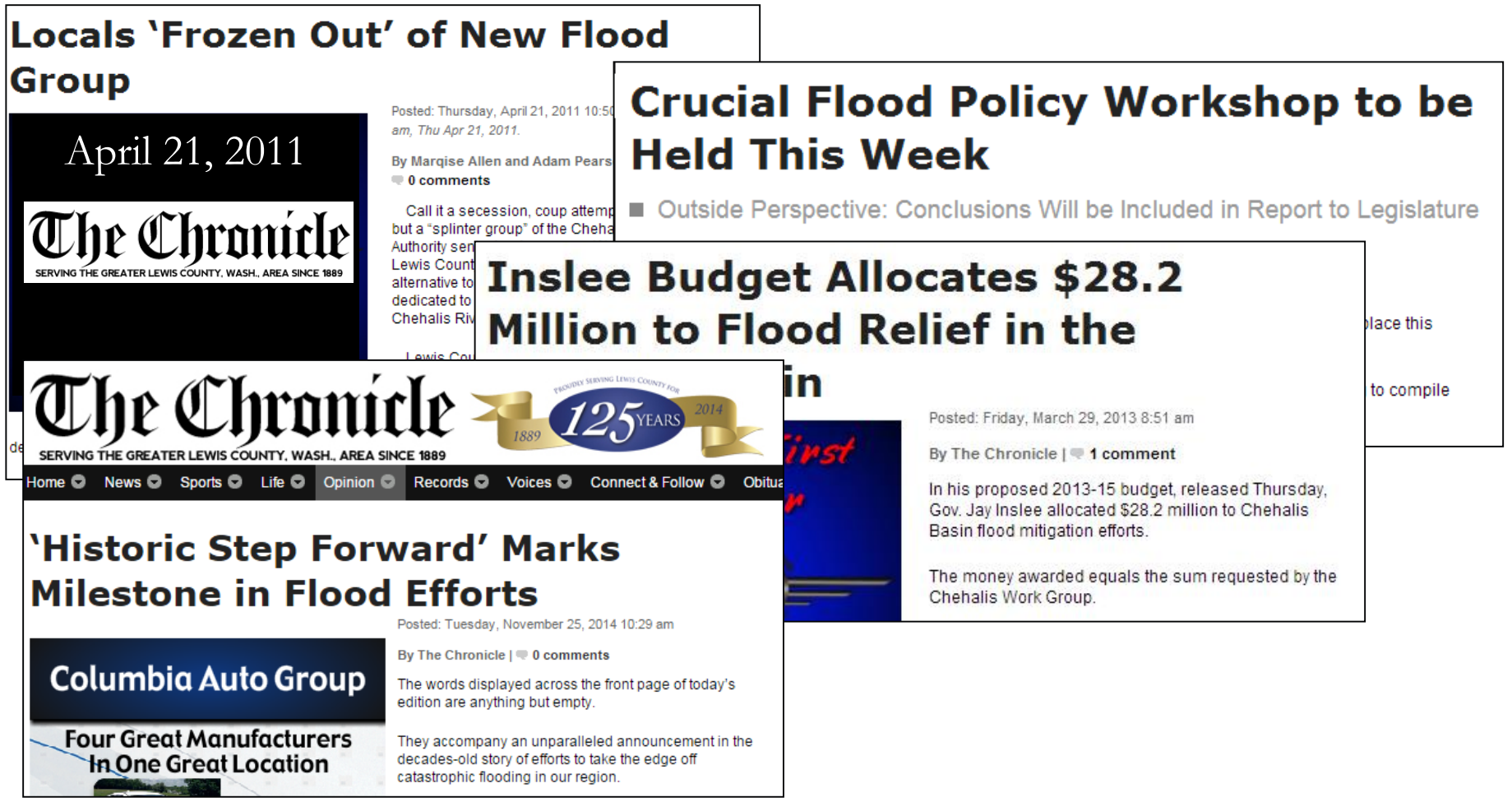
Substance:
What are the issues?



People/Relationship:
Who is involved?
What is the dynamic between them?

Process:
How do you get there?

It took 2 years, but people were able to come together to start finding solutions



Things can actually change!

Chehalis Basin Flood Authority to meet less frequently; longtime leader resigns from facilitator position

Sat Mar 24th, 2018 6:00pm · NEWS

"There's a culture here that I don't think we can sustain without meeting face to face regularly," said Wood.

That culture that Wood spoke of was not always a reality for the Chehalis Basin Flood Authority. **In the early part of the decade, members spent much of their time quarreling with each other over perceived slights. At one point, the infighting and lack of progress became so egregious that the Legislature threatened to pull funding, and several entities threatened to break off from the group to create their own splinter cell workgroup**.

That's when Jim Kramer of the William D. Ruckelshaus Center was brought in to calm the waters as facilitator of the group. Over the last six years, Kramer **introduced concepts such as taking turns when talking, compiling detailed meeting agendas ahead of time and respecting other people's points of view**.

On Thursday, Kramer announced his resignation from the facilitator position, stating that he felt he had fulfilled his objective and that funds could be now be better spent on "more important work." The ensuing round of applause and compliments that flowed forth from the rest of the Flood Authority members was a fitting example of the sort of culture that Kramer helped foster during his tenure.

PennState

INSTREAM FLOW COUNCIL
Protecting, Maintaining,and
Restoring Aquatic Ecosystems

Questions? Thoughts?

Thank you

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Asst. Director, Institutes of Energy and the Environment
The Pennsylvania State University
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Twitter: @fowler_lara