Water Governance and Policy: California to Michiana

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Water Rights:

Authorization to use, sell, divert, or manage water

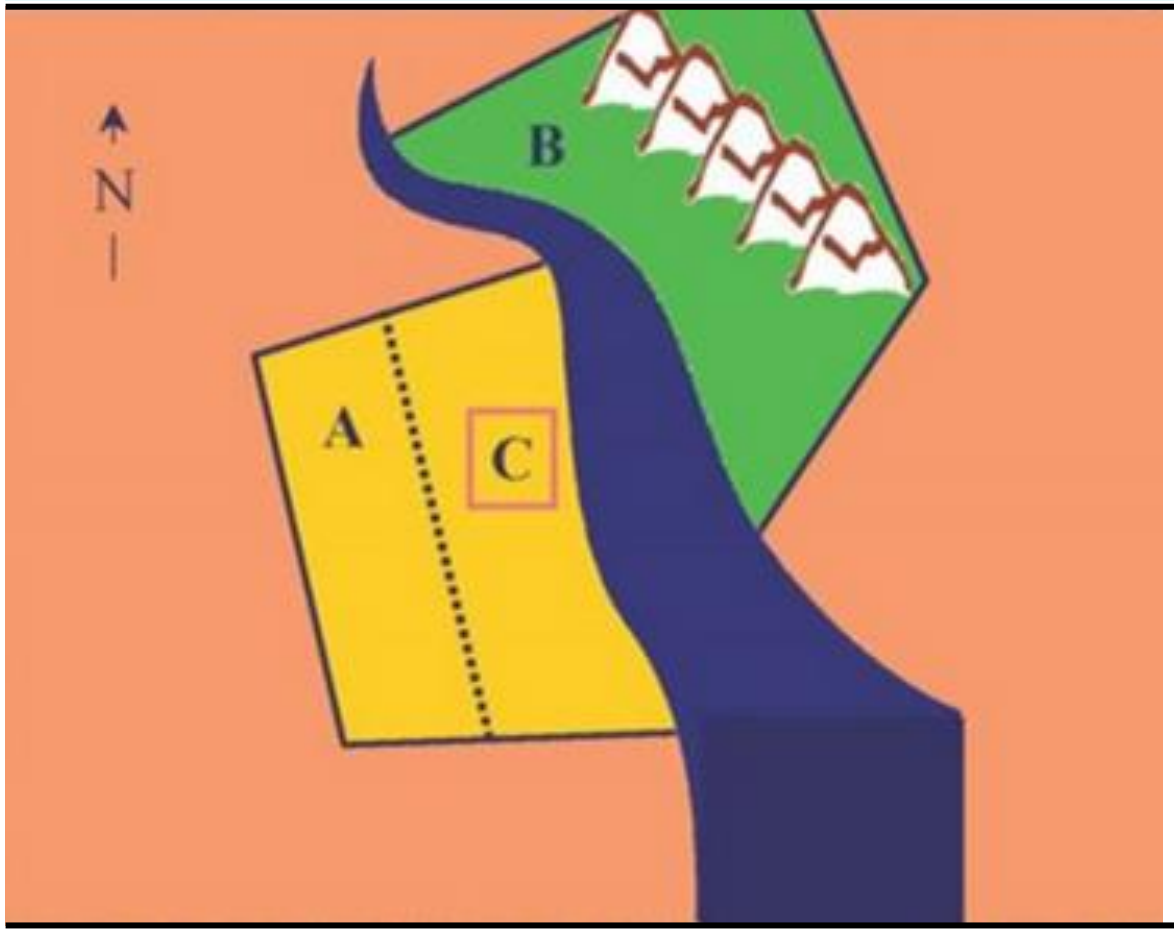
Water laws and permits vary (widely!) from state-to-state

Major implications for:

- Conflicts
- Emergency/Disaster situations (i.e. long-term drought)

Surface Water

Riparian Water Rights



The landowner has rights to the body of water that touches the borders of their property

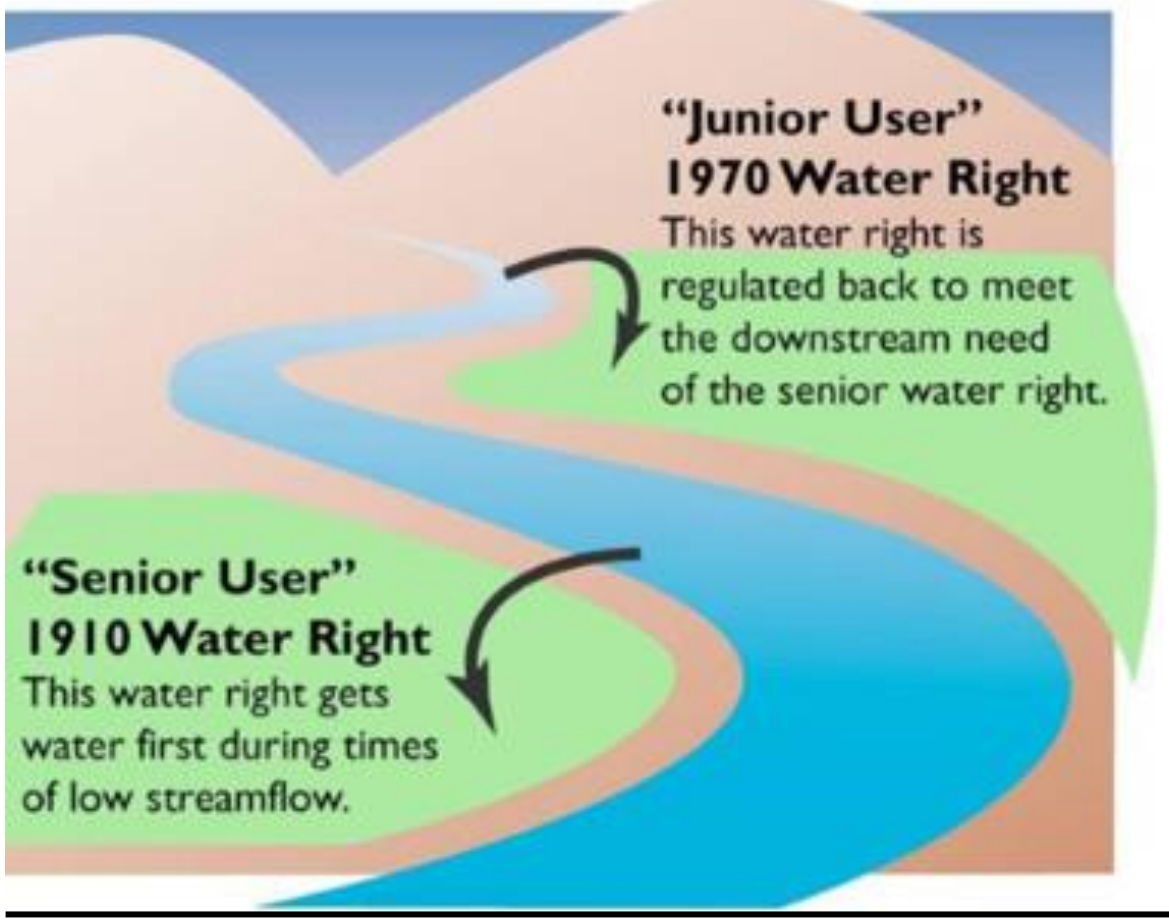
They may use the water for domestic needs, as long as it does not obstruct the natural flow of water for other riparian owners

Riparian rights are subject to severance—A loses water rights if separated from C

Most eastern states have riparian rights

Image Credit: CA State Water Resources Control Board

Prior Appropriation Doctrine



- Permit-holders have the right to divert a specified amount of water for an approved, beneficial use
- In the case of a water shortage, priority access to water is given to the holder of the older permit
- In some states, permit holders can sell water rights separate from the land

Most western states

Image Credit: Brent Howard

Prior Appropriation Doctrine

The theory behind why this doctrine was instilled in the Western US:

- Essentially “first-come first-served”
- The argument was that if limited available water had to be shared (as in riparian doctrine) no user would have sufficient water to mine/irrigate agriculture
    - If someone takes all the water from someone else downstream, they are still entitled to it as long as they were the first to settle on the stream.

Groundwater

Absolute Dominion Rule

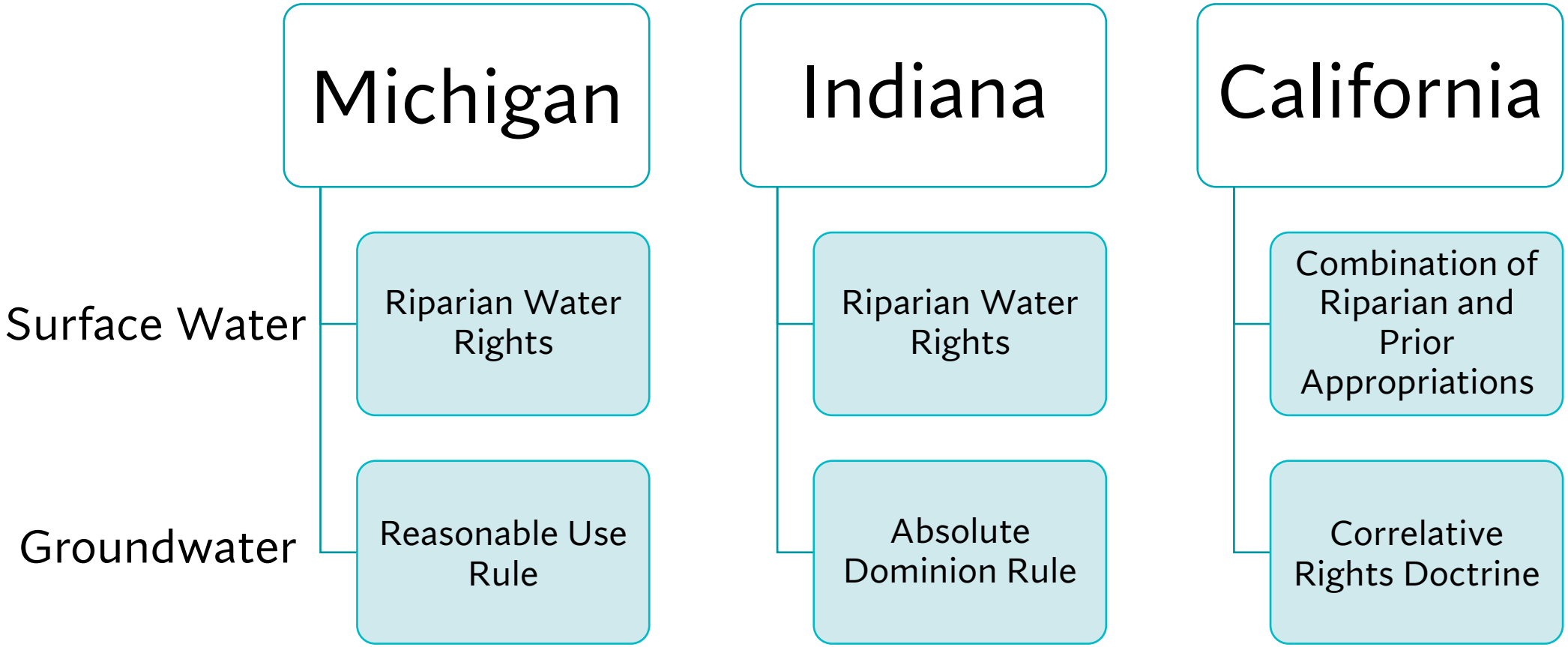
- A landowner can use as much groundwater as possible—does not need to consider impact to neighbors

Correlative Rights Doctrine

- Landowners overlying the same aquifer are limited to a reasonable share of the aquifer's total supply

Reasonable Use Rule

- Requires landowners to put water to a reasonable use on the overlying tract of land


Michigan
Indiana
California
Surface Water
Groundwater
Riparian Water Rights
Reasonable Use Rule
Riparian Water Rights
Absolute Dominion Rule
Combination of Riparian and Prior Appropriations
Correlative Rights Doctrine

Reporting Requirements

Michigan & Indiana

Water users with the capacity to withdraw 100,000 gallons/day (70 gallons/minute) are required to make an annual report on water use

- Applies to both surface and groundwater withdrawals

In Michigan, these water users are also required to register with EGLE using the Water Withdrawal Assessment Tool

- Screening system that predicts whether a large quantity withdrawal is likely to cause an adverse impact

Great Lakes-St. Lawrence River Basin Water Resources Compact

- Ban on new diversions of water from the Basin (limited exceptions may be allowed)
- Establishes consistent standards in review of water use
- Reviews every five years
- Each State/Province will implement a water conservation and efficiency program that may be voluntary or mandatory

Image Credit: Ohio DNR

California Surface Water

- Those who withdraw or are allowed to withdraw more than 10 acre-ft/year are required to measure water use.

- Requirements for type of monitoring device/frequency depends on size of diversion (more than 1000 acre-ft/yr requires hourly monitoring)

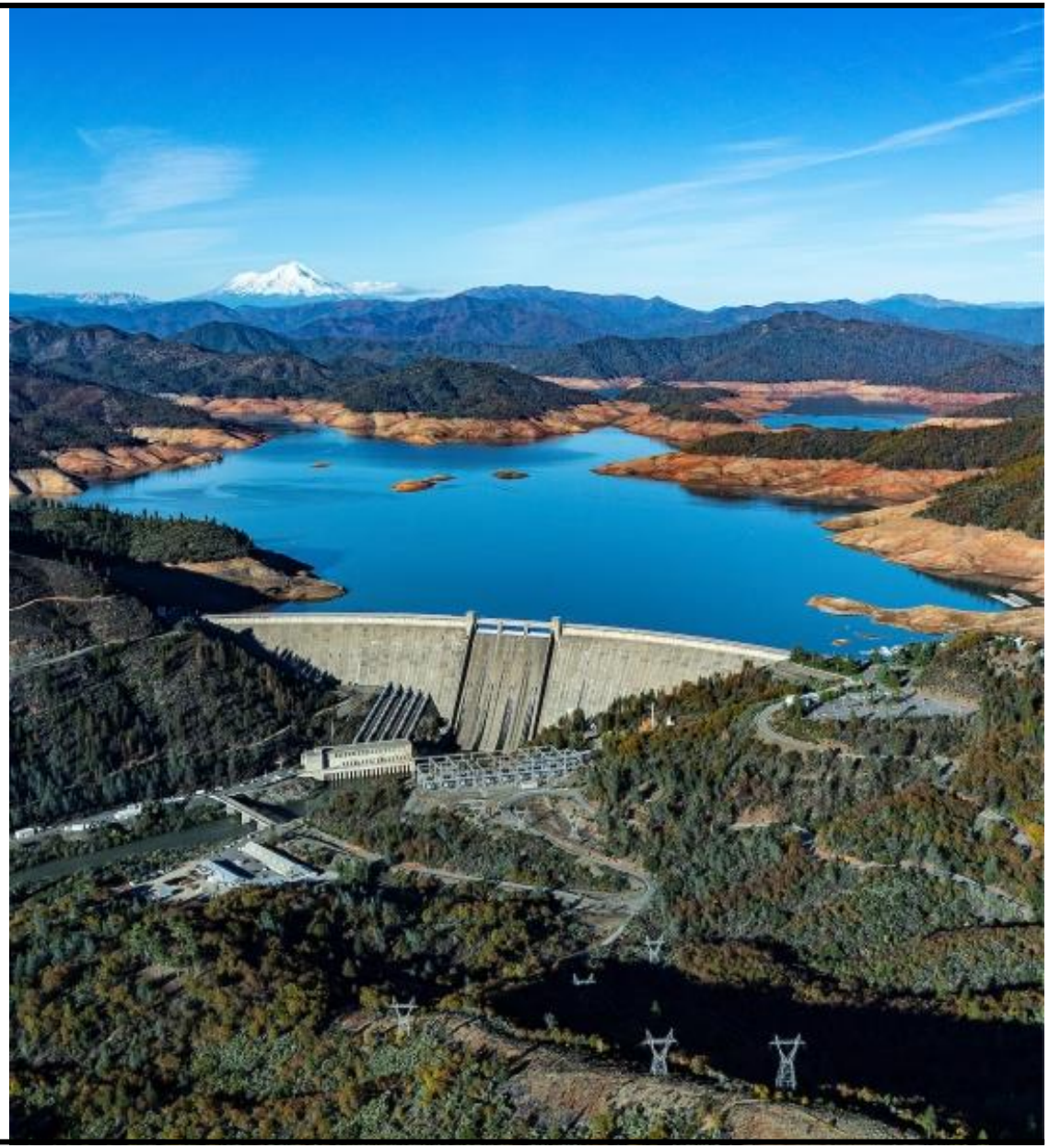


Image Credit: Mercury News

California Groundwater

Regulated at the regional water board level (9 in the state)

- Generally must report location, capacity, and extraction information (as well as pay fees per AF)

Adjudication: When water users within a basin are in dispute over legal rights to water, adjudication can occur. A court decides:

- Who the water rights owners are
- How much groundwater those rights owners can extract
- How the groundwater are will be managed

29 groundwater areas in California are adjudicated (mostly in So. Cal).

Why do we care?

In times of crisis, water rights, legal precedent, and regulations inform how the government is able to respond.

Policy Example: SGMA

Sustainable Groundwater Management Act in California (passed in 2014)

Requires high and medium priority (94) water basins to reach sustainability in 20 years

- Looking to balance the water budget
- Accounts for 98% of groundwater pumping

Heavily impacts surface and groundwater users

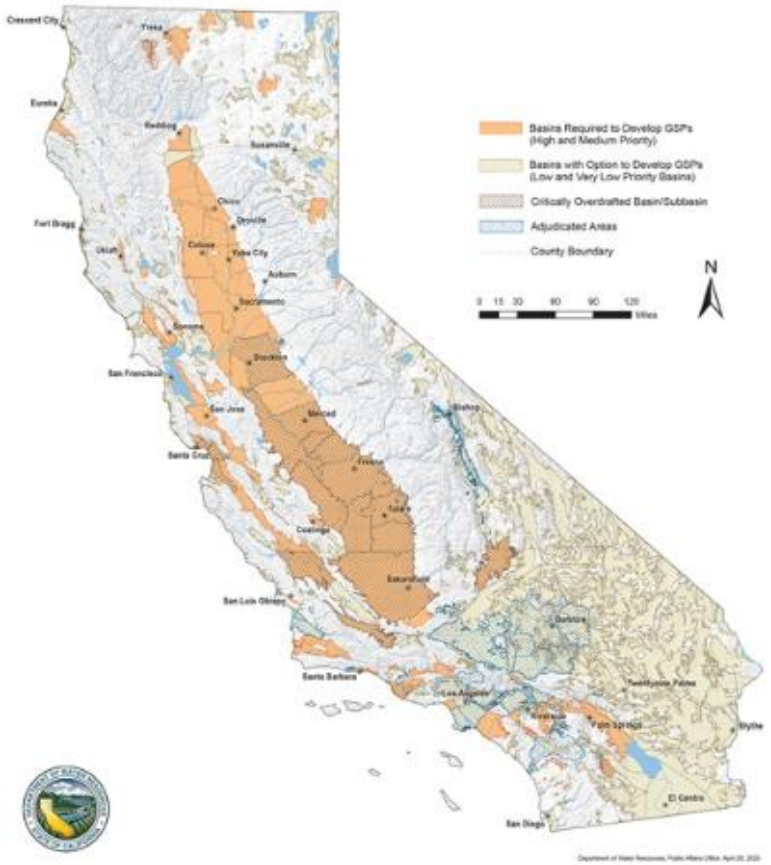


Image Credit: CA DWR

Policy Example: SGMA

Having surface water rights is key to remaining in agriculture under SGMA!

In times of drought, surface water users can rely on groundwater pumping, and recharge the aquifer with surface water during wetter years—theoretically the basin can remain in balance

For farmers only using groundwater, rainfall is not enough to offset groundwater pumping—their use will be restricted.

Tulare County, CA

Image Credit: NPR, Dan Charles

Policy Example: Adjudication

Many water rights in CA operate similarly to Michiana—claimed and/or exercised without objection by other parties.

When competing demands are too high, adjudication may be necessary

- Enforceable order allocating water rights
- Takes years (decades) to complete

While highly linked to surface water rights, they often do not follow the water rights' technical application

Adjudication in Mojave Basin

1990-2000 Adjudication Process

The court noted that “strict adherence to priority of rights and correlative rights among water users of equal status created uncertainty and potential economic consequences”

Required equitable sharing across water users of similar rights holders

Image Credit: Mojave Resource Management

Innovations: Pajaro Valley

Other basins looking for cooperative solutions—mostly works for small basins.

<u>Pajaro Valley:</u>

Groundwater metering and pricing

Recharged net metering (subsidized)

Recycled Water Program

Image Credit: Pajaro Valley Water Management Agency

Water Budgets of the Great Lakes

A water budget is like a checking account. To balance the budget of a particular lake, you would add all of the deposits (runoff, precipitation, inflow from the previous lake, and diversions in) and subtract all of the withdrawals (evaporation, outflow to the next lake, and diversions out). You may find that the numbers listed here don't always exactly balance (or add up to 0), which speaks to the uncertainty of some of these values. Scientists are still working on capturing more accurate estimates for components of the water budget, particularly overlake precipitation and evaporation. However, the values here are the best available, and generally give a good representation of the relative contributions of each of the budget components.

All values are averaged over the period 1950-2010 and are in thousands of cubic meters per second.

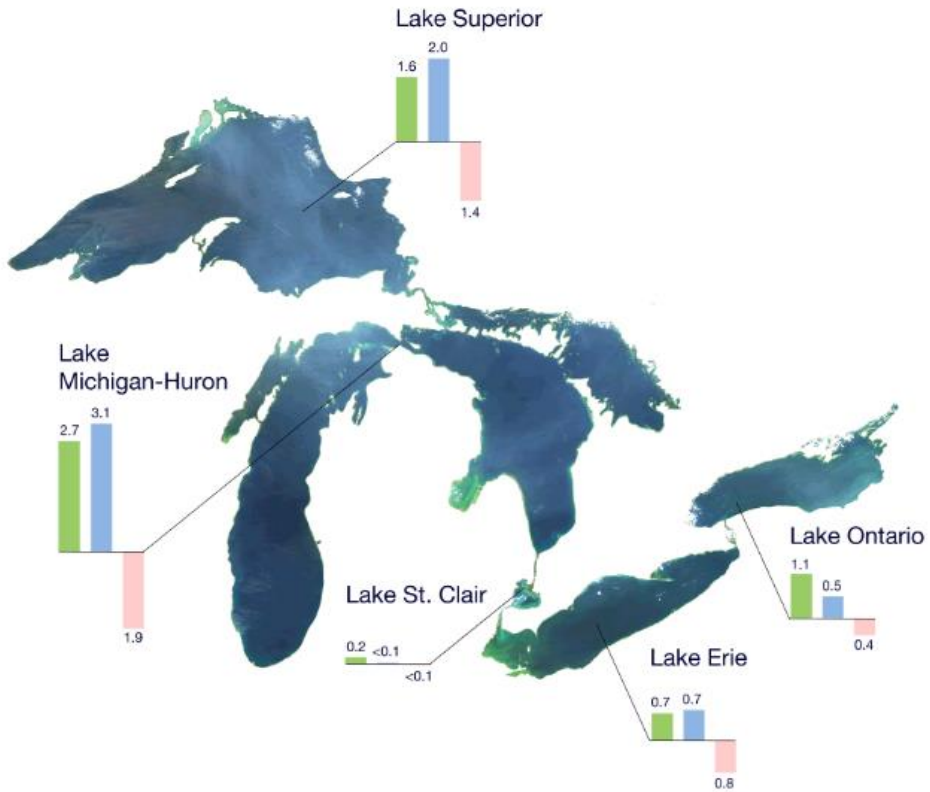
Budgets Within Lakes

The map below shows contributions of runoff, precipitation, and evaporation to the water budgets of each of the Great Lakes - these are their internal budgets.

Runoff (deposit) is all of the water that runs off of land in a lake's watershed, making its way into rivers, which eventually empty into the lakes. It is impacted by precipitation over land, evaporation over land, and transpiration (the water sucked up by plants).

Overlake Precipitation (deposit) is precipitation that falls on the lake surface.

Overlake Evaporation (withdrawal) is evaporation that occurs from the lake surface.

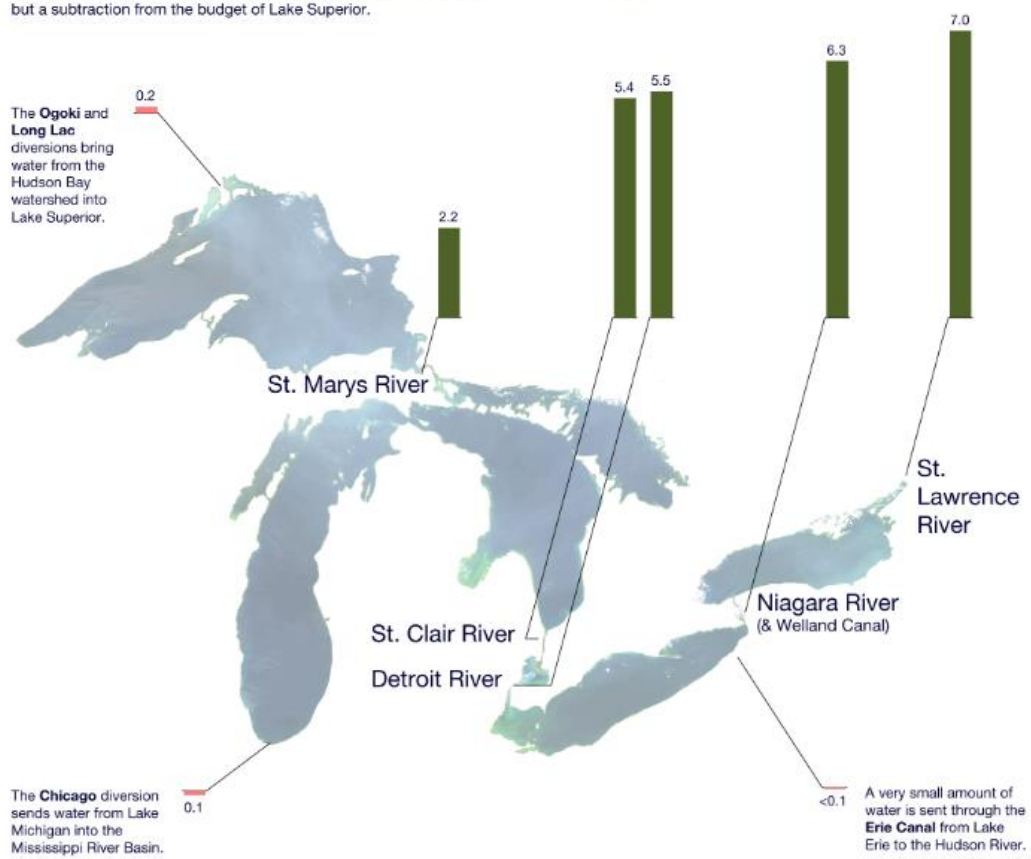


Flow Between Lakes and Diversions

The Great Lakes are a system where water flows from a beginning (Lake Superior) to an end (the St. Lawrence River and eventually the ocean). Excesses from a lake's internal budget flow to the next lake. As you move downstream, the amount of water flowing through the various connecting channels increases, as excess water is collected in each lake.

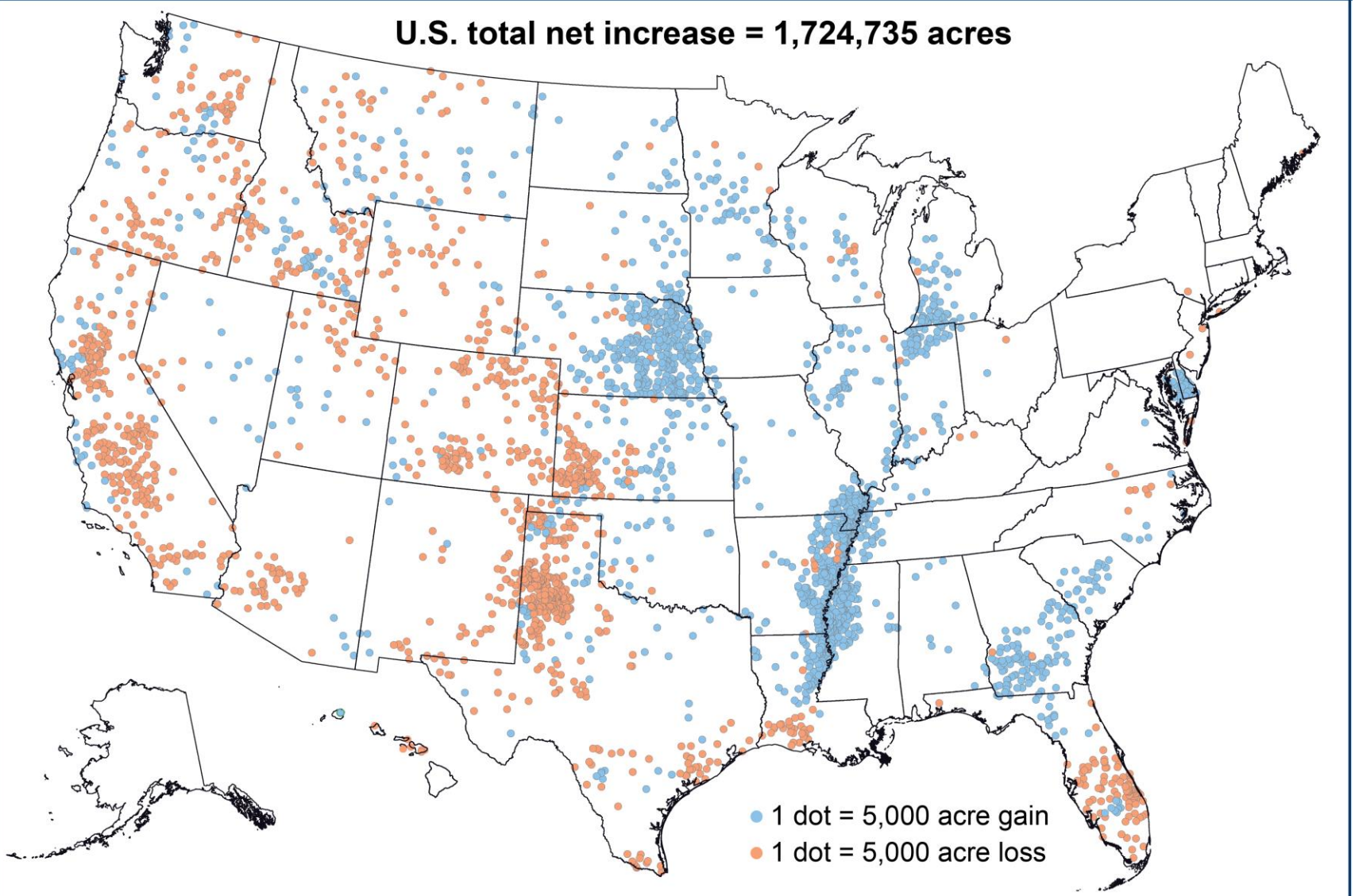
Flow Between Lakes can be a **deposit or withdrawal**. For example, the St. Marys River flows between Lake Superior and Lake Huron. Its flow is an addition to the budget of Lake Michigan-Huron, but a subtraction from the budget of Lake Superior.

Diversions can be **deposits or withdrawals,** and are negligible relative to the internal water budget of the Great Lakes.



Data: Hunter, T.S., A.H. Clites, A.D. Gronewold, and K.B. Campbell. Development and application of a North American Great Lakes hydrometeorological database - Part I: Precipitation, evaporation, runoff, and air temperature. Journal of Great Lakes Research 41(1):65-77 (DOI:10.1016/j.jglr.2014.4.12.006) (2015).
Satellite Imagery: NOAA CoastWatch

Change in U.S. acres of irrigated agricultural land by county, 1997-2017



Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service, 1997 and 2017 Census of Agriculture.

Is water quantity a major issue in Michiana? No!

However, be mindful of smaller groundwater aquifers:

- Water rights can come into play, especially in Indiana (Absolute Dominion Rule)
- But legal cases thus far have only related to actively trying to hurt a neighbor by draining all their water (i.e. *Gagnon v. French Lick Springs Hotel Company*)

Thank you!

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