HansonBridgett

Groundwater Recharge

Legal and Strategic Considerations of Project Development

NATIONAL AGRICULTURAL LAW CENTER WEBINAR

JUNE 19, 2024

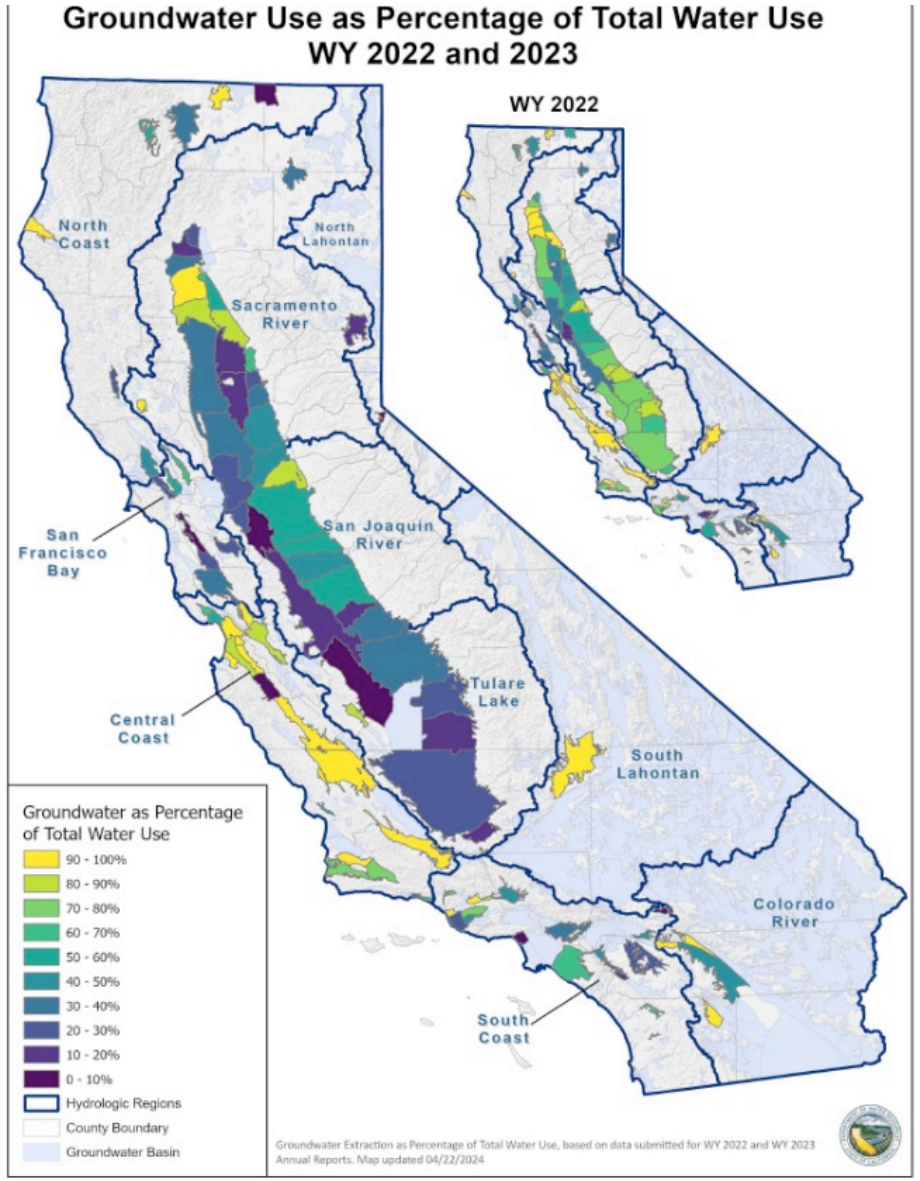
Overview

- Groundwater Use & Regulation
- Groundwater Recharge
- Legal and Physical Constraints
- Cost / Benefit Analysis
- Conclusions

Groundwater Use & Regulation

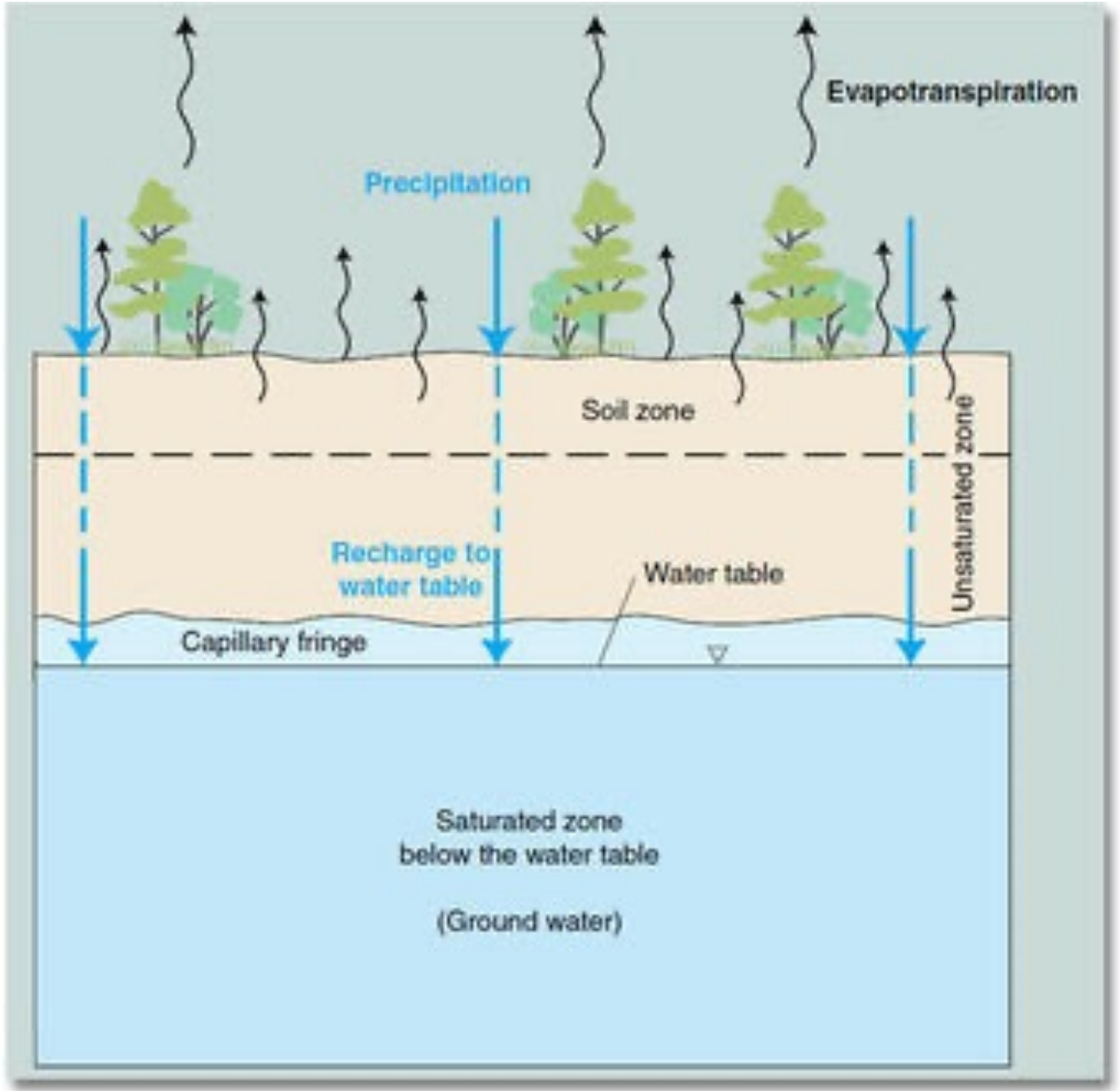
Importance of Groundwater

- Groundwater is the source of about **37 percent** of the water that county and city water departments supply to households and businesses
- **90%** of U.S. water systems rely on groundwater to meet demand
- Groundwater provides drinking water for more than **90 percent** of the rural population
- About **42 percent** of the water used for irrigation comes from groundwater

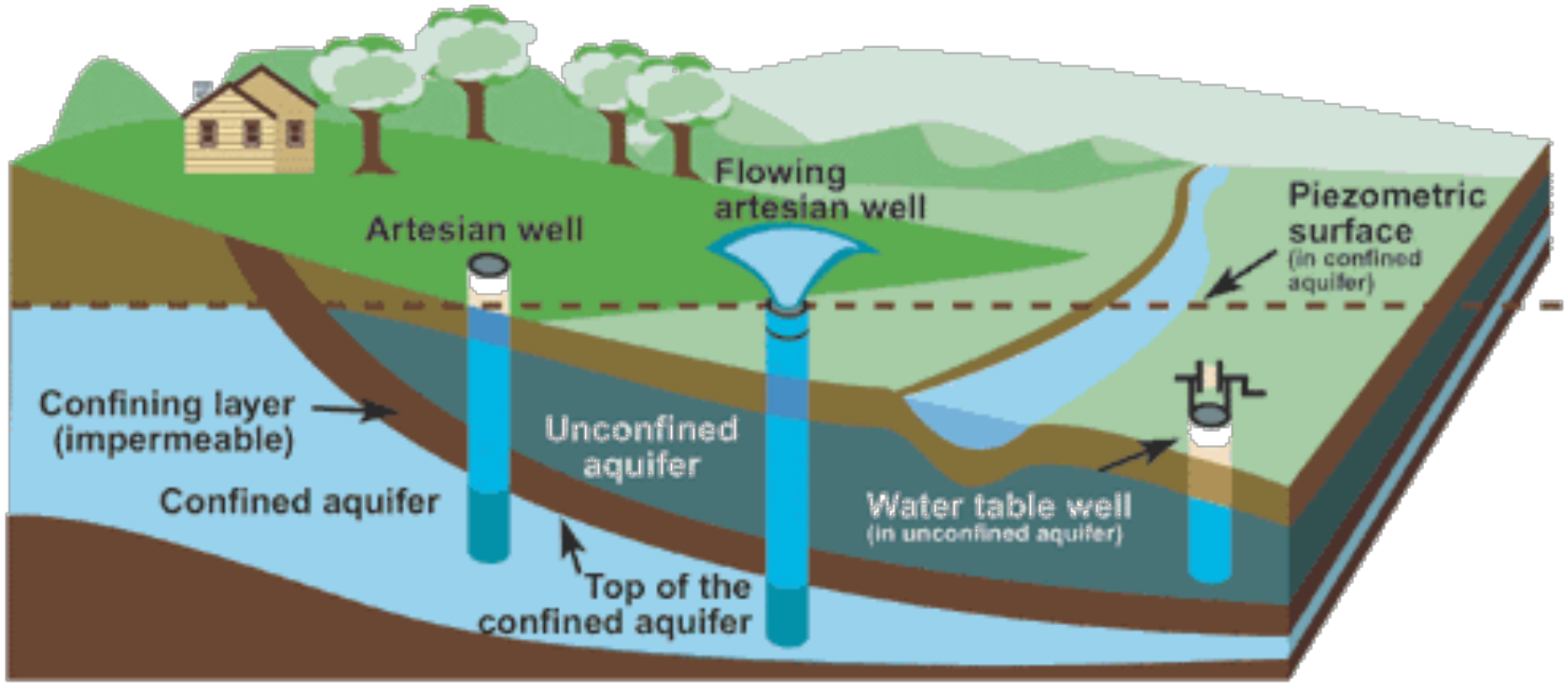

Groundwater Use as Percentage of Total Water Use
WY 2022 and 2023
WY 2022
North Coast
North Lahontan
Sacramento River
San Joaquin River
San Francisco Bay
Central Coast
Tulare Lake
South Lahontan
Colorado River
South Coast
Groundwater as Percentage of Total Water Use
90 - 100%
80 - 90%
70 - 80%
60 - 70%
50 - 60%
40 - 50%
30 - 40%
20 - 30%
10 - 20%
0 - 10%
Hydrologic Regions
County Boundary
Groundwater Basin
Groundwater Extraction as Percentage of Total Water Use, based on data submitted for WY 2022 and WY 2023 Annual Reports. Map updated 04/22/2024

Groundwater Definitions

- "Percolating waters" are underground waters, the course and boundaries of which are incapable of determination. (Nevada Revised Statutes 534.0135)
- "Groundwater" means water percolating below the surface of the earth. (Texas Water Code section 36.001(5).
- "Groundwater" means water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water… (CA Water Code 10721(g).)


Evapotranspiration
Precipitation
Soil zone
Unsaturated zone
Recharge to water table
Water table
Capillary fringe
Saturated zone below the water table
(Ground water)

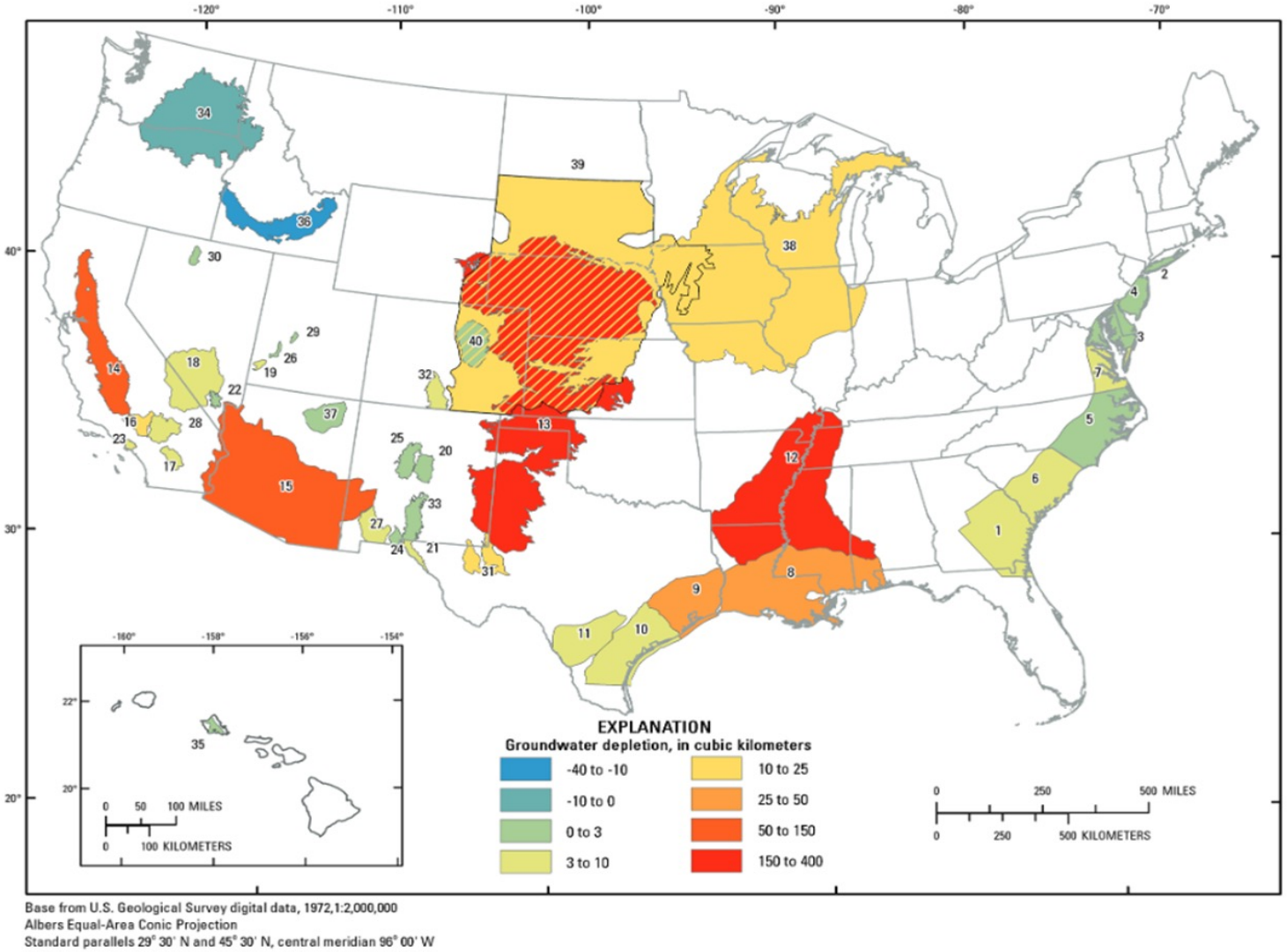
Aquifers and wells



Drivers of Recharge

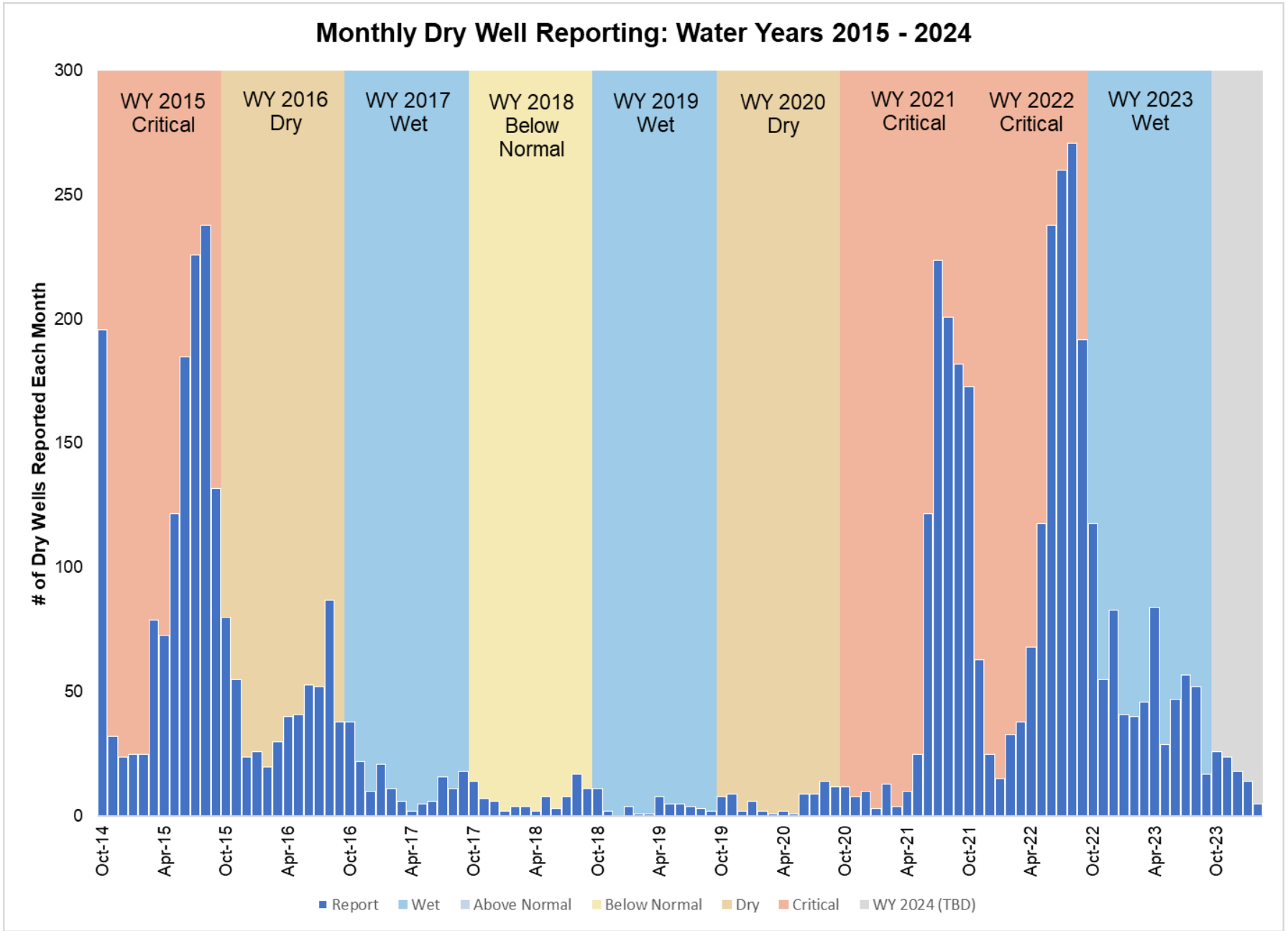
- Historical use can drive groundwater recharge efforts as supplies are reduced.
- Regulation can drive groundwater recharge as supplies are reduced.
- Groundwater recharge has typically been a reactive response, later in time in comparison with surface water supply projects.

Historical use



Base from U.S. Geological Survey digital data, 1972,1:2,000,000
Albers Equal-Area Conic Projection
Standard parallels 29° 30' N and 45° 30' N, central meridian 96° 00' W

Figure 2. Map of the United States (excluding Alaska) showing cumulative groundwater depletion, 1900 through 2008, in 40 assessed aquifer systems or subareas. Index numbers are defined in table 1. Colors are hatched in the Dakota aquifer (area 39) where the aquifer

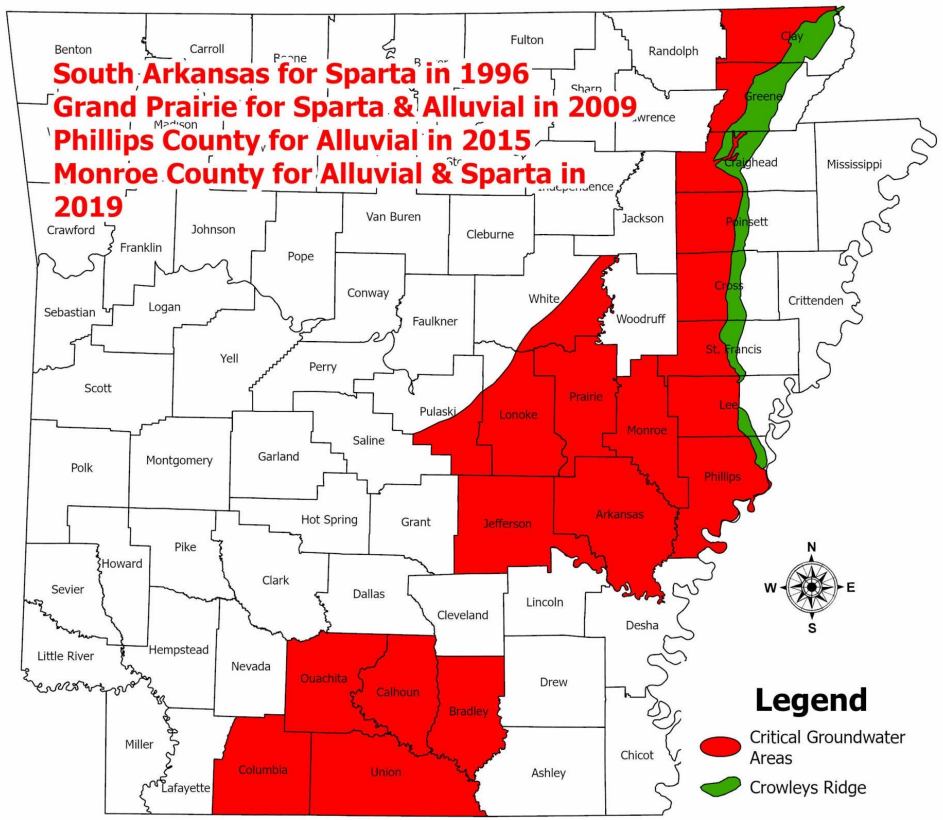

Monthly Dry Well Reporting: Water Years 2015 - 2024
# of Dry Wells Reported Each Month
300
250
200
150
100
50
0
WY 2015 Critical
WY 2016 Dry
WY 2017 Wet
WY 2018 Below Normal
WY 2019 Wet
WY 2020 Dry
WY 2021 Critical
WY 2022 Critical
WY 2023 Wet
Oct-14
Apr-15
Oct-15
Apr-16
Oct-16
Apr-17
Oct-17
Apr-18
Oct-18
Apr-19
Oct-19
Apr-20
Oct-20
Apr-21
Oct-21
Apr-22
Oct-22
Apr-23
Oct-23
Report
Wet
Above Normal
Below Normal
Dry
Critical
WY 2024 (TBD)

Regulation: Different approaches

- California: didn't regulate groundwater until 2014, when it passed the Sustainable Groundwater Management Act and committed the state to ending overuse in the most depleted areas by 2040.
  - Regulate, limit, control extractions; establish groundwater charges, impose well spacing requirements; require rotational pumping; impose penalties.
- Arkansas: established Critical Groundwater Areas in 1991, which enables various tax credits for activities that take surface water instead of groundwater (impoundments, conversions, land leveling).

Critical Groundwater Areas

NATURAL RESOURCES DIVISION



California's Critically Overdrafted Groundwater Basins

Groundwater Recharge

Groundwater Recharge

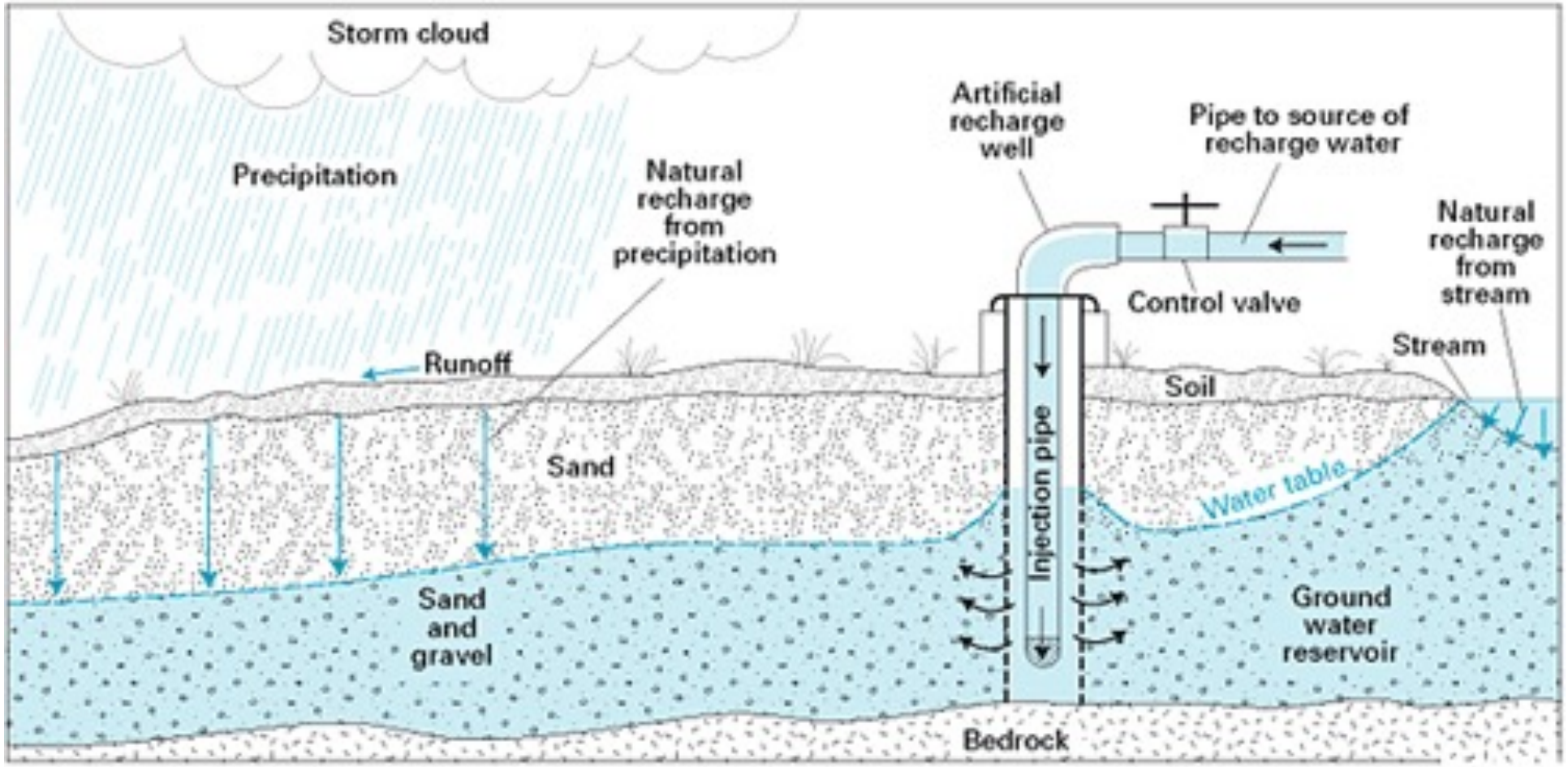
- Direct recharge: Increases aquifer inflows
  - Percolated or injected directly into aquifer.
  - Timing of supply and demand less relevant.
- In lieu recharge: Decreases aquifer outflows
  - By providing surface water to meet a demand that would otherwise be met from groundwater extraction
  - But demand and surface water availability often don't align.

Spreading Basins

On Farm Recharge

Controlled Release

Aquifer Storage and Recovery Wells



Legal & Physical Constraints

Relative Water Quality

- **California Water Code section 1810 (b): Regarding Conveyance**
  - Provides that facilities, such as for conveyance, may be used for fair compensation provided that, among other things:
  - "The commingling of transferred water does not result in a diminution of the beneficial uses or quality of the water in the facility, except that the transferor may, at the transferor's own expense, provide for treatment to prevent the diminution, and the transferred water is of substantially the same quality as the water in the facility."
- Bureau of Reclamation also has Water Quality Guidelines
- State Water Project also has Water Quality Guidelines

Water Quality

- **Federal Safe Drinking Water Act (SDWA): For ASR Projects**
- SDWA prohibits underground injection of waste liquids that may affect sources of drinking water, unless specifically authorized.
- Underground Injection Control Program. The UIC program consists of six classes of injection wells which mandate differing types and depths of injection activity depending on the potential for that injection activity to endanger drinking water.
- The source of the water injected would dictate which class of injection well, and thus what type of permit, would be needed. For example, Class II injection wells are used to inject fluids associated with oil and natural gas production. Class V injection wells are used to inject non-hazardous fluids resulting from agricultural activities.

Water Rights

- From a water rights perspective, there are two key questions for any potential recharge project:
  - (1) what is the legal classification of water to be recharged; and
  - (2) will the project recapture the water it recharges?

Water Rights

- In California a permit is not needed if the water to be recharged is:
  - Wastewater
  - water under a pre-1914 right.

Water Rights

- **Vested Water Right**
  - Traditional Permit
  - GSA Streamlined Permit
- **Temporary Water Right**
  - 180-day Permit
  - 5-year Permit
- **No Water Right**
  - Exec. Orders N-7-23 & N-4-23
  - Water Code Section 1242.1

Water Rights

- A riparian right generally does not include a right to storage other than, in California, short-term "regulatory" storage for less than 30 days.
- Thus, a riparian right is an ill-suited basis for groundwater recharge.

Water Year 2023

- Recharge:
  - 1.2 million acre-feet of groundwater recharge was permitted
  - 400,000 acre-feet of flood water was recharged using the Governor's Executive Orders
  - 4.1 million acre-feet of managed groundwater recharge occurred in 2023.
- Extractions
  - Total extractions: 9.5 MAF in 2023; vs. 17 MAF in 2022.

Water Rights Fees

- Application Fee: The fee structure for standard permits is $1,000 plus $15 per AF, with cap of $648,914.
- Pending Annual Application fee. $750 plus $0.109 per each acre-foot
- Annual Fee when issued: $300 plus $0.109 per each acre-foot
- Petition Annual Fee: $1,000 + $0.40 per each acre-foot up to $10,000

- Example: 50,000 AF application = $648,914 application fee; $6,200 annual application fee; $5,750 annual fee, $10,000 annual petition fee.

Is water available?

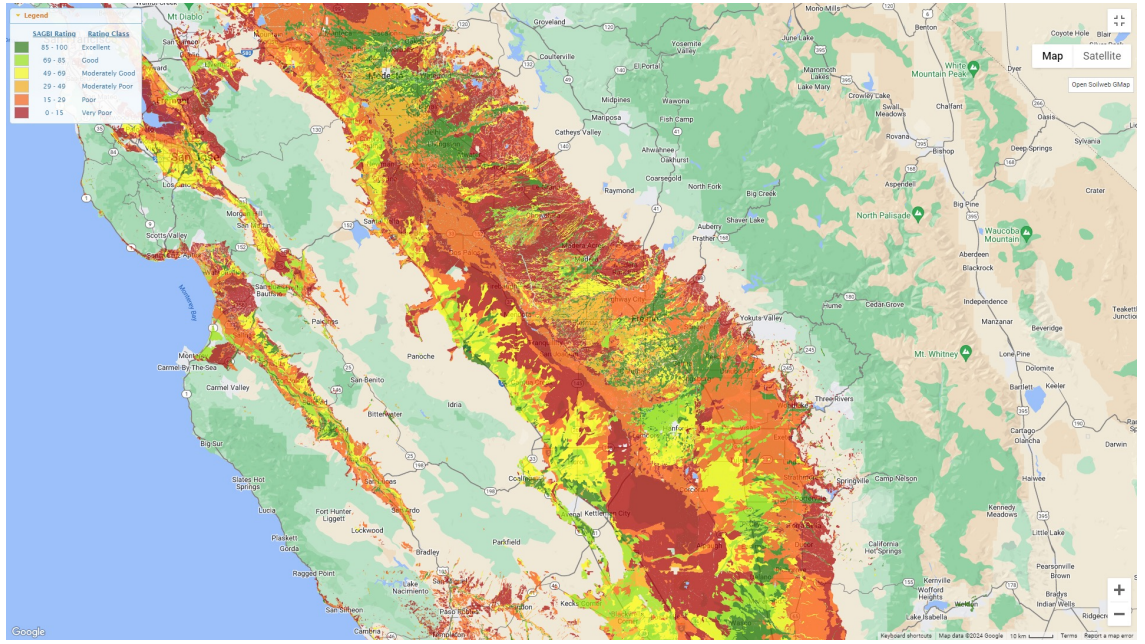
- Water Code section 1260(k) states in part that "[e]very water right application submitted to the State Water Board must include sufficient information to demonstrate a reasonable likelihood that unappropriated water is available for appropriation"("WAA").
- The only water available for appropriation is water that is not already being beneficially used by another water right holder. (Water Code, § § 1202,1225;
- “Unappropriated water does not include water being used pursuant to an existing right…” (23 Cal. Code Regs., § 695.)

Is water available?

- The North Coast Policy
- As "streamlined" methodology applies to Groundwater Sustainability Agencies ("GSAs") and local agencies under the Sustainable Groundwater Management Act.
  - 90th percentile of daily flows from December 1st to March 31st. Diversions limited to 20% of daily flow.
  - Alternatively, presence or imminent threat of flood conditions
- Water Code Section 1259.6: the Board to develop and adopt regulations to govern consideration of climate change effects in water availability analyses.

Site selection

- Where wont push contaminants into aquifer
- Where water will reach aquifer
- Proximity to water source and conveyance
- Pump costs vs gravity flow.
- Recovery operations and impacts to others
- Ex: UC Davis Soil Agricultural Groundwater Banking Index



Cost Benefit Analysis

Benefits

- Long-term water supply security
- Reduced reliance on imported water
- Reduced impacts: subsidence, water levels, conveyance infrastructure
- Species benefits: groundwater-dependent ecosystems, wetland habitats
- Control saltwater intrusion
- Reduce flood risk, improve water quality,
- Groundwater credits

Costs

- Site development
- Conveyance
- Ongoing operation and maintenance
- Permitting: GSA, County, SWRCB, CDFW, CEQA, ESA, …
- Reporting
- Water right fees

Conclusions

Conclusions

- Have clear project goals regarding:
  - Whether project will recovery water
  - Type of water right or entitlement and path to securing
- Seek agency coordination
  - Multi-agency permit process is complex
- Seek stakeholder buy-in
  - Agreements regarding water quality, recovery operations, “leave behind” amounts.

Thank you!

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