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Big Ag, Big Oil, and the California Water Crisis

Climate change is wreaking havoc on California's water stability. The state is mired in long-term drought, punctuated by relatively brief periods of extreme precipitation and catastrophic flooding. But the impacts of climate change on state water supplies only tell part of the story. Most of California's water goes not for individual use, but instead to corporate agricultural and fossil fuel interests (Big Ag and Big Oil). These users reap tremendous profits, while more than 1 million Californians lack access to clean water.

Incidentally, these corporate agricultural and fossil fuel interests — consuming an exorbitant amount of freshwater resources in California — are also prime contributors to our global climate crisis.

California's water system was developed decades ago, during a historic period of water abundance. But as that brief period faded and climate chaos accelerated, large corporate interests have maintained their water access through massive donations to politicians, lobbying, and "philanthropic" giving.

Moving forward, California cannot continue to allow these powerful interests to use and abuse the state's water. Large almond operations owned by Beverly Hills billionaires, large factory farms that produce tremendous waste while using enough water to supply whole cities, and the fossil fuel industry that continues to fuel the climate crisis it spent years covering up can no longer be allowed to dictate California water policy or misuse vast quantities of the state's water.

California Governor Gavin Newsom has started to make moves to rein in some of the worst abuses from oil production by championing legislation to stop oil drilling near homes and schools. But when it comes to water policy and the most egregious water abuses, he has been silent. Instead, he has championed industrial water schemes like desalination, large-scale water recycling, and building a massive tunnel around the Sacramento-San Joaquin Delta. All of these

approaches are expensive, energy intensive, and dangerous for the environment.

Instead, as this report lays out, Governor Newsom, state regulators, and the state legislature need to chart a new course. They must develop new water policy for the state that makes good on the promise that Californians should have access to clean, reliable water and that stops the expansion of (and begins to roll back) the damaging industries using the most water.

Developing water policy that speaks to the realities of climate change requires political courage and the courage to oppose the wishes of major political funders. But if Governor Newsom truly wants to be a climate leader and to address California's long-term water issues, the current crisis provides him an opportunity for action.

On the intersecting issues of food, water, and climate, we are at a crossroads. Californians are looking to Governor Newsom for leadership. This report maps out an approach that would move California, boldly and with justice, into a sustainable water future.

Key Findings

- Climate change is making California drier. The state, along with the rest of the American West, may have already entered a period of perpetual mega-drought, with conditions in the coming decades predicted to be much drier than the present.
- Large agribusinesses and oil and gas operators use massive and unsustainable amounts of water, permitted by ineffective regulations that put profits over people.
- Expanded nut crop acres required more than 520 billion gallons more water in 2021 than just four years prior. Alfalfa irrigation guzzles around 945 billion gallons of water per year, and mega-dairies use more than 142 million gallons per day. Meanwhile, climate-polluting oil and gas operators devoured 3 billion gallons of freshwater between 2018 and 2021.
- Water management and rights systems that give deference to corporations have allowed billions of gallons of California's water to be exported overseas in the form of water-intensive products like almonds, alfalfa, and dairy.
- California's water rights are extraordinarily complicated — historically favoring large industry and agribusiness — and allow for trading with little transparency. The state's precious groundwater is over-pumped and under-regulated. California's attempt at regulation, the Sustainable Groundwater Management Act, falls far short of protecting groundwater by delaying action until 2040 and prioritizing industry over the human right to water.
- Communities are being denied the human right to water as thousands of wells are running dry across the state. Low-resource households, people of color, and communities already burdened with environmental injustices are more likely to face severe drought impacts and water shortages.

Key Recommendations

- Governor Newsom must use executive and emergency powers to immediately stop egregious misuses of California water. This includes preventing the planting of new almond and alfalfa acres on the salty, dry west side of the San Joaquin Valley, banning new mega-dairies, and ending new oil and gas drilling.
- Governor Newsom and California's State Water Resources Control Board (SWRCB) must ensure that water rights and water allocations benefit the public. California water policy must advance the goal of the human right to water and ensure safe, clean, affordable, and accessible public water.
- Governor Newsom must reject corporate schemes being peddled as water solutions — like costly desalination facilities, the proposed Delta Conveyance Project, and wastewater recycling. Instead, he must promote equitable and climate-friendly water solutions.
- The California legislature should expressly define all water, including groundwater, as a public trust resource, and the government should protect and preserve this common resource for the public. The public trust doctrine, which is rooted in long-standing legal principles, enables states to hold

and protect natural resources,[1] putting the public interest before private interests and making it more difficult for private parties to inflict harm.[2]

- Congress must pass legislation — including the federal Water Affordability, Transparency, Equity and Reliability (WATER) Act — to fully fund our water and wastewater systems, put water systems back in the control of the public, help ensure water access and affordability, and restore the commitment of the federal government to protecting water.

Background: Water and Drought in California

Climate change is worsening drought conditions in California. While punctuated by periodic wet years, the state is experiencing the driest 22-year period in more than 1,200 years.[3] Governor Newsom declared the drought crisis a statewide emergency in October 2021 but has yet to take on California's biggest water abusers.[4] Long-term, exceptional droughts can lead to land subsidence, severe ecological disruption, increased severity and intensity of wildfires, widespread water shortages, low agricultural yields, high water prices, and poor water quality.[5]

California, along with the rest of the American West, may have already entered a period of perpetual mega-drought. Mega-droughts are decades-long, intense periods of drought. Scientists predict that future conditions will be so much drier than the present that soil moisture levels that today would be considered indicative of a mega-drought are projected to become average by the end of this century.[6] When rain and snow do come, they are more intense and, combined with dry soils, increase risk of flooding. Rising temperatures will cause more evaporation of freshwater supplies, less recharge of groundwater, and severe impacts on surface water resources.[7] Small water utilities and the communities they serve, especially those that depend on groundwater, suffer under these conditions.[8]

California relies on a complex system of dams and canals to transport water from the wetter, snowier northern and mountainous parts of the state to the

southern, semi-arid region — which is also home to large urban areas and industrial agricultural production.[9] For example, massive water infrastructure projects like the State Water Project and the Central Valley Project distribute surface water from the Sacramento-San Joaquin Delta throughout the state.[10] Southern California also receives water from the Colorado River via Lake Havasu and the Colorado River Aqueduct.[11] But these massive diversions and complicated systems of allocation have proven to be band-aid solutions for a dry state with a limited water supply.

The Colorado River

Seven states (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming), along with Mexico, rely on the Colorado River to provide water for more than 40 million people.[12] Despite holding more seniority than anyone, Indigenous tribes have been historically excluded from water rights discussions. They were excluded from the creation of the Interstate Compact that determines water allocations and ignored again in 2007 during renegotiations. Promises have been made to include Indigenous tribes during renegotiations in 2026, but that remains to be seen.[13]

The Interstate Compact makes the Colorado one of the most regulated rivers in the world.[14] The river's watershed covers 244,000 square miles, while the Colorado River itself is 1,450 miles long.[15] It is now also the country's most endangered river.[16] Agricultural irrigation is the most intensive use of the river, using over 8 million acre-feet of water annually. This water irrigates 5.5 million acres, supporting 15 percent of U.S. crops and 13 percent of livestock.[17]

Eighty percent of the river's water is put toward agriculture, and 80 percent of this supply is used for crops like alfalfa, which is used largely as feedstock for factory farms.[18] Like many of the water sources in the West, the Colorado is being overused: annual demand has exceeded supply since the early 2000s, with demand predicted to increase in the coming decades as the population of the American Southwest swells.[19]

Myriad factors including bad policy, corporate greed, and climate change are to blame for the mismanagement and decline of the Colorado River. The end result is that the river no longer reaches the ocean; it now dries up before it reaches Mexico.[20] Because the Compact was formed during a period of abnormally high rainfall, allocations assume more water than is usually present in the system.[21] The Compact did not plan for declining water levels; as climate change and corporate greed continue to reduce the flow, drastic changes will need to be made.[22]

In August 2022, amid critically low reservoir levels at Lake Mead and Lake Powell, the U.S. Bureau of Reclamation declared a Tier 2 water shortage for the Colorado River and announced steep allotment cuts for Arizona (21 percent) and Nevada (8 percent).[23] California did not face any required cuts, but in October 2022, four Southern California water agencies announced that they will cut water use by 9 percent (1.6 million acre-feet over the next four years) in an attempt to keep water levels at Lake Mead high enough to continue hydropower generation.[24]

Problem 1: Four Major Misallocations and Misuses of Water That Put Corporations Over People

Almond empires, alfalfa exporters, mega-dairies, and oil and gas operators use millions of gallons of California's limited water during times of intense dryness to amass tremendous profits, while local wells run dry. And as these private interests guzzle down the water supply, more than 1 million people in California do not have access to safe drinking water.[25]

The state's water budget cannot afford any misuse of water, but a lack of government regulation and arcane water allocation invite misuse. Governor Newsom and the SWRCB must exercise their constitutional and common law obligations to regulate surface water and groundwater to protect water as a public trust resource, guard against "waste and unreasonable use," and ensure fair access to water for all Californians.[26]

Water-intensive almond industry expands despite water scarcity

Agriculture accounts for 80 percent of the water diverted for use in California.[27] In 2018, farms across the state used an estimated 7.9 trillion gallons of water.[28] One massive agricultural water user — almond cultivation — occupies more than 1.64 million acres.[29] Tree nuts such as almonds, pistachios, and walnuts accounted for 20 percent of California's agricultural water usage in 2013.[30]

Almond and other nut orchards are permanent and need to be watered year-round, which is becoming increasingly difficult with limited water resources.[31] California exported an estimated 58 percent of its almonds overseas in 2020 — essentially exporting abroad 880 billion gallons of the state's already

limited water supply.[32] Despite dwindling water supplies and years of intense droughts,[33] thirsty almond acreage in California has increased steadily since the 1990s. Undeterred by the significant 2012-2016 drought years, almond acreage increased by nearly 78 percent from 2010 to 2022 (see Fig. 1).[34]

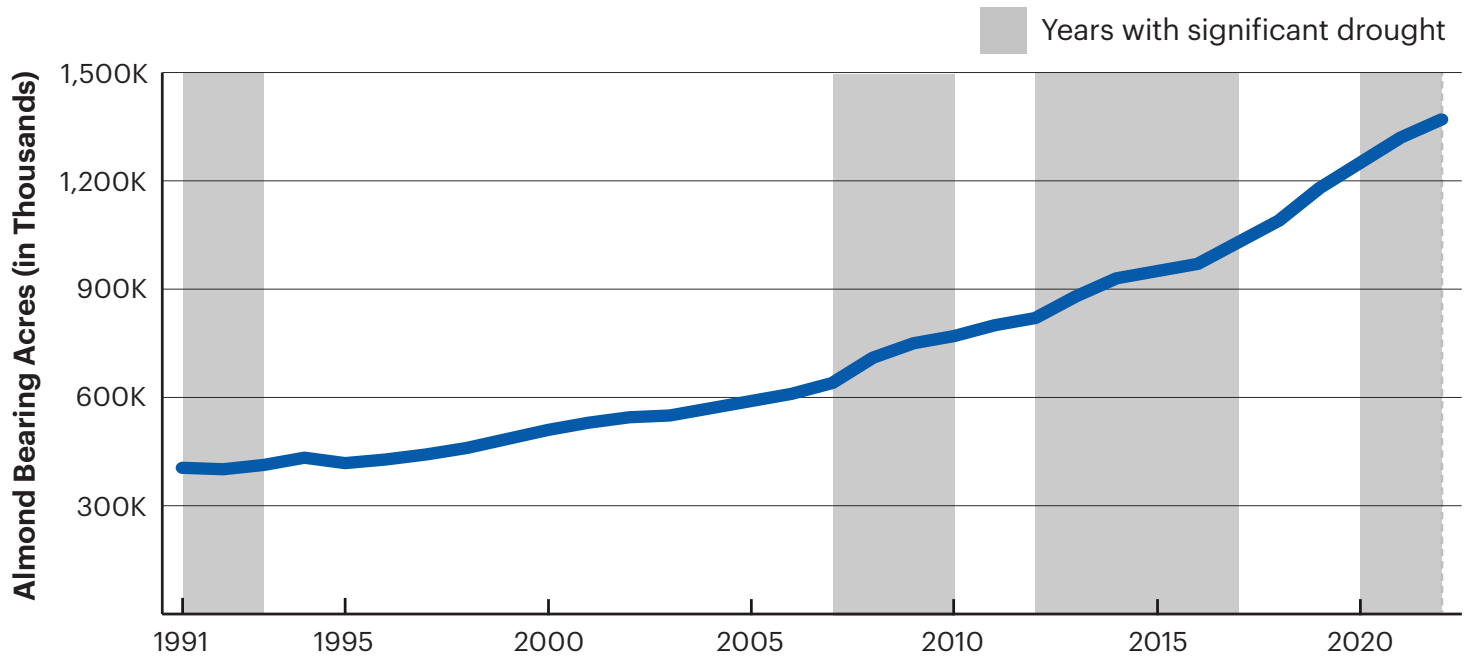
Almond- and pistachio-bearing acres in 2021 required an estimated 523 billion more gallons of water for irrigation than bearing acres did in 2017. Just the increase in water consumed by this nut crop expansion over the four-year period could have supplied 34.1 million people (87 percent of California's population) with the recommended standard indoor daily water use for an entire year.[35]

California's almonds are a lucrative crop, valued at $5 billion in 2021.[36] The almond boom has been a windfall for a handful of corporate farms, including the Wonderful Company — one of the largest growers and packers of almonds and pistachios in the world, owned by Beverly Hills billionaires Stewart and Lynda Resnick.[37] The Resnicks are also major political contributors and gave $250,000 to Governor Newsom's campaign against the recall election in 2021.[38] Just less than 6 percent of California's almond farms operate on more than 500 acres, but that 6 percent makes up more than half of all almond acres in the state.[39]

Arid California produces 82 percent of the world's water-thirsty almonds.[40] California's almonds generated $4.7 billion in foreign sales in 2020 to markets such as Europe, India, and China.[41] The majority of the state's almonds (55 percent in 2020-2021) are produced in the southern part of the Central Valley.[42] This region of the state is also suffering from severe water scarcity.[43]

The rising global demand for almonds has spurred growers to plant almond and pistachio trees galore on the dry, hot, and salty soils of the western San Joaquin Valley.[44] But almond growth threatens the already fragile water resources in this region.[45] The drier west side of the San Joaquin Valley is also home to more large landowners and massive farms compared to the east side.[46] Not only is the west side dry, but much of its soil is also contaminated with naturally occurring selenium and salt due to years of heavy irrigation. The irrigation-induced, selenium-filled runoff is a major environmental problem that harms migrating birds and chokes the San Joaquin River with excess salt.[47] Poor drainage and runoff further complicate irrigating this region.[48]

FIG. 1: Almond Acreage in California, 1991 - 2022



DATA SOURCES: U.S. Department of Agriculture (USDA); California Department of Water Resources (DWR). "California's Most Significant Droughts: Comparing Historical and Recent Conditions." January 2020 at i.

The Westlands Water District in the southwestern San Joaquin Valley is the largest agricultural water district in California.[49] Home to rampant almond production,[50] this water district pumped more than 1 million acre-feet (326 billion gallons) of groundwater from 2015 to 2020 — enough to provide more than half of California's residents with the new recommended amount of daily indoor water usage (42 gallons per person per day) for one year.[51] Nevertheless, during the Trump administration, the U.S. Department of the Interior awarded the Westlands Water District a massive, permanent water contract that, according to the *Los Angeles Times*, would provide the district with around twice as much water as is used by the 4 million residents of Los Angeles each year.[52]

Water misuses, such as the cultivation of water-intensive almonds on the west side of the valley, mean that most of the state's surface water supplies from the Sacramento-San Joaquin Delta have gone to irrigation — not to household usage in southern California and other urban areas.[53] The scale and intensiveness of almond production compared to other crops makes its production in the desert during a drought unsustainable. Almond orchards are permanent and need to be watered year-round, which is becoming increasingly difficult with limited water resources.[54] Small farmers who do not have senior water rights or the capital to drill deeper wells must make difficult decisions with their limited water.

Alfalfa and exploiting old water rights through land grabs

Alfalfa uses a huge share of California's agricultural water, occupying nearly 580,000 acres of California farmland.[55] Farms on average apply 5.0 acre-feet of water per acre of alfalfa, necessitating an estimated total of 945 billion gallons to irrigate all of California's alfalfa acreage.[56] This is more than enough water to provide the daily recommended indoor water usage for every Californian for 18 months.[57] Alfalfa farming is dominated by massive farms, with the largest 6 percent of farms (each with 1,000 acres or more) owning more than one-third of the total irrigated acres of alfalfa. Four farms collectively own more than 30,000 irrigated acres of alfalfa.[58]

Like almonds, alfalfa is water intensive and often exported overseas. In 2020, California exported 35 percent of its hay (which includes alfalfa), making

it the state's twelfth most valuable export, generating hundreds of millions in revenue for large landowners.[59] But this thirsty crop is grown in some of the state's hottest and driest areas, including the Imperial Valley.[60] When water-intensive crops are exported, the large quantities of water used to produce them are also shipped abroad in a process called virtual water trading (see "What Is Virtual Water Trading?" below).

California's water rights system allows corporations to buy land with senior water entitlements, and to gain access to cheap water with few restrictions. The southwestern United States is an attractive location for companies seeking water, as there are strong legal protections for farms and agriculture.[61] For example, despite complicated, over-budgeted water allocations from the Colorado River, senior appropriative water rights in the Palo Verde Valley give the region first priority during droughts and shortages.[62] In Blythe, California, an 1877 appropriative water rights claim declares that Blythe has "unquantified water rights for beneficial use." Water is sourced to Blythe from the Colorado River via a series of dams and canals.

For instance, Fondomonte Farms, a subsidiary of the Saudi company Almarai, owns 15,000 acres and massive storehouses in Blythe to grow and export alfalfa back to Saudi Arabia to feed dairy cows.[64] The move to California and other parts of the southwest came after the Saudi government banned growing wheat, green fodder, and livestock feed in 2016. The Saudi government determined that these water-intensive crops were not a good match for the desert climate and limited freshwater resources in Saudi Arabia.[65]

Al Dahra ACX, a subsidiary of a company based in the United Arab Emirates, also farms alfalfa and other crops in southern California and Arizona.[66] Al Dahra ACX leases 4,700 acres in Palo Verde Valley and owns 2,600 acres in the Imperial Valley. Both Almarai and Al Dahra farm all over the world.[67] California's patchwork water rights system has proven to favor agribusinesses that grow lucrative, water-intensive crops while wells run dry.[68] Virtual water trading is not unique to foreign-held companies — it is the product of a heavily consolidated, corporate agriculture system, and highlights the need for California to reimagine its support for water-intensive agriculture in a region vulnerable to prolonged drought.[69] While foreign and domestic companies export large quantities of alfalfa, much of the alfalfa grown in California remains to feed the state's nearly 1.7 million dairy cows on mega-dairies.[70]

Mega-dairies consume and threaten California's water resources

In 2020, California exported one-third of its dairy products out of the country.[71] While homes are running out of water in the Central Valley, large mega-dairies are making considerable profits and using millions of gallons of water a day.

Factory farms are notoriously water intensive. Mega-dairies[72] consume enormous amounts of water to irrigate crops that absorb animal waste, water cows, flush manure from barns, and run milking equipment. The most recent U.S. Department of Agriculture Census of Agriculture reported that nearly 1.7 million cows were living on California's mega-dairy farms. Recent mega-dairy expansion comes at the expense of smaller, family-scale dairies. From 1997 to 2017, California lost 60 percent of its family-scale dairies (those with under 500 cows). California has more dairy cows living on mega-dairies than any other state — three times as many as the number two state, Idaho.[73]

What Is Virtual Water Trading?[63]

The flow of water used to produce goods that are then exported around the world is called virtual water trading. Virtual water trading is already common, but exporting water from nonrenewable groundwater basins is predicted to double by 2100 as climate change intensifies water scarcity in some regions.

Exporting groundwater can contribute to depletion and over-drafting that can have significant consequences, especially in over-drafted basins like the Central Valley.

Food & Water Watch (FWW) estimates that it takes 142 million gallons of water a day to maintain the dairy cows on California's mega-dairies — more than enough water to provide the daily recommended indoor water usage for every resident of San Francisco, San Jose, and San Diego combined. That volume is limited to the water that is given to cows to drink and that is used to wash cows and buildings; it does not include the large quantities of water needed to raise feed like alfalfa, or to move manure into storage systems.[74] A lack of available numbers tallying the dairy industry's water use in California presents a problem as the state seeks to tackle the reality of climate change.

These operations also threaten California's already limited water supply with pollution. Agriculture is the leading polluter of U.S. rivers and streams,[75] and the U.S. Environmental Protection Agency's weak rules allow most mega-dairies and other factory farms to avoid meaningful regulation.[76] The sheer amount of manure that mega-dairies produce often exceeds what crops can absorb, resulting in over-application and runoff into local waterways.[77] Mega-dairy waste disposal also threatens to contaminate scarce groundwater resources. Drinking water contamination from factory farms has been likened to rural America's "own private Flint."[78]

In California, mega-dairies are concentrated in the Central Valley. Tulare County has nearly 500,000 dairy cows on factory farms (those with 500-plus cows), more than any other California county.[79] It is acutely impacted by the drought and water shortage, with more than 400 wells reported dry in Tulare County from January 2021 through November 2022.[80] Mega-dairies also emit greenhouse gases such as methane and nitrous oxide that fuel the drought with warming temperatures, increased evaporation, lower soil moisture, etc.[81]

Oil and gas companies suck up water and accelerate the climate crisis

As California suffers climate change and endures longer, drier wildfire seasons, oil and gas operators use hundreds of millions of gallons of freshwater for drilling operations annually.[82] It is a vicious cycle:

Oil and gas drilling operations use hundreds of millions of gallons of freshwater every year.

Fracking and drilling contribute to climate change and suck up finite water resources, then drought and wildfires worsen from climate change.

FWW found that from January 2018 to March 2021, the oil and gas industry used more than 3 billion gallons of freshwater for drilling operations — water that may otherwise have supplied domestic systems.[83] That is the equivalent of around 4,570 Olympic-sized pools[84] or more than 120 million showers.[85] The freshwater sucked up by the oil and gas industry during this period could have provided everyone in the city of Ventura with the recommended amount of daily water for 22 months.[86] California cannot afford to waste its water on industries that unequivocally worsen the water crisis.[87]

At the same time, oil and gas development pollutes and threatens California's finite freshwater resources. Some corporations have routinely injected oil wastewater directly into the state's aquifers.[88] This toxic wastewater contains fracking fluids, contaminants, brines, and radioactive materials.[89] Injecting toxic wastewater into underground wells puts drinking water at risk and is linked to increased earthquake activity.[90] These corporations also threaten valuable groundwater resources by storing wastewater in

unlined ponds across the San Joaquin Valley. And in some cases, oil and gas wastewater is mixed with groundwater or surface water to supply agribusinesses with irrigation — a controversial and potentially dangerous practice.[91]

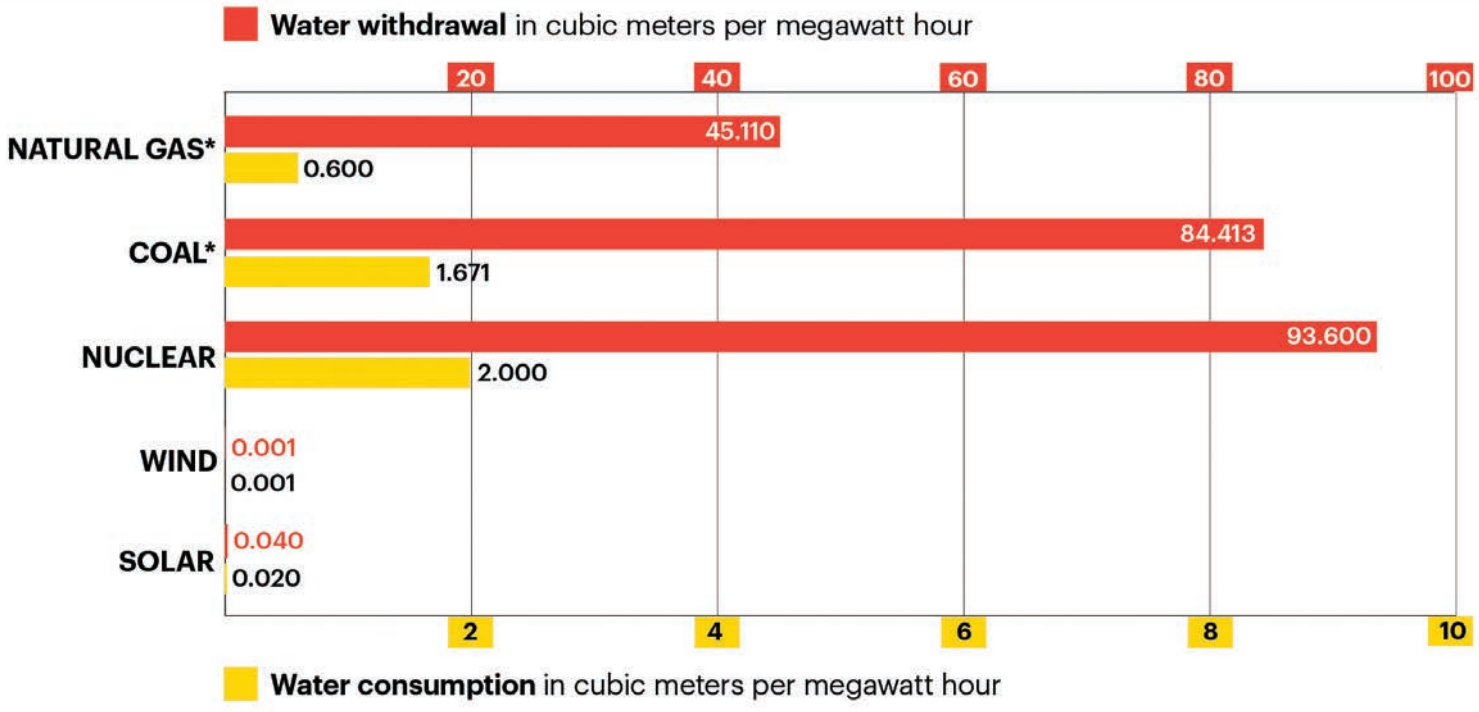
California is facing long-term drought, but the risks of water shortages are not distributed evenly. In the Central Valley, low-resource communities, communities of color, and communities already burdened by environmental injustices bear the brunt of drought impacts.[92] More than 80 percent of California's new and active wells drilled by the oil and gas industry are in the Central Valley.[93] And while families battle water shortages, California permits the oil and gas industry to use and abuse the state's limited water supplies to extract fossil fuels and profits at the public's expense.[94]

Real solutions: Saving water by switching to renewables

Real solutions with meaningful water savings are within reach. One example is ending the unsustainable relationship between water and fossil fuel electricity generation. In 2015, thermal power plant cooling accounted for 40 percent of all water withdrawn in the United States.[95] From 2000 to 2015, there were 18 instances where coal plants were unable to generate electricity due to insufficient or high-temperature water supplies needed for the cooling process.[96] Multiple studies have found that lifecycle water consumption and withdrawal for wind energy and solar photovoltaics (PV) are significantly lower than water intensity for fossil fuels such as coal and natural gas, and even for nuclear (see Fig. 2).[97] Fossil fuel technologies will not be able to meet future energy demands.

FWW found that if California replaced fossil fuel and nuclear electricity production with 100 percent renewable energy sources like solar PV and wind, the state could save 82 million cubic meters of water annually. This is a 98 percent reduction from current levels consumed for fossil fuel and nuclear electrical generation. Similarly, California's water withdrawals could be reduced by over 99 percent while producing the same amount of energy — amounting to nearly 6.3 billion cubic meters of water. That is equivalent to 2.5 million Olympic swimming pools of water.[98]

FIG. 2: Lifecycle Water Consumption and Withdrawal Intensities by Energy Technology



*Average of once-through and recirculation cooling systems

DATA SOURCE: FWW analysis of Kondash et al. (2019).

The fossil fuel industry pushes a number of false solutions to greenwash its dirty systems, including dry cooling power plants and carbon capture and storage (CCS).[99] Switching to dry cooling systems at power plants would decrease water dependency but sacrifice efficiency, in turn increasing the emissions from burning coal and natural gas.[100] Carbon capture also fails this trade-off, by not only failing to decrease carbon emissions but also significantly increasing lifecycle water usage.[101]

While much of this water savings in California would be saltwater, freshwater accounts for nearly 30 percent of both water consumption and withdrawals recirculating cooling systems.[102] In addition, transitioning to renewable energy generation has positive impacts on nearby water ecosystems. In California, the adoption of solar and wind energy improves resilience to droughts and groundwater sustainability, which in turn maintains sustainable levels of groundwater.[103]

Problem 2: California's Poor Water Management Strategy

A complicated system of water entitlements

California's water laws and rights have been implemented in a way that fails to protect this finite resource, contributing to water shortages in the state. The state distributes water entitlements via a "unique blend" of appropriative and riparian rights[104] (see "Understanding Water Rights" at right).

In California, a "water right" does not constitute ownership of water, but rather a legally recognized entitlement to use water for "reasonable" and "beneficial" uses without harming anyone else's water entitlements.[105]

California's water entitlements are complicated and vary depending on the water's source (surface versus groundwater); when (pre- or post-1914) and how the right was originally acquired; whether the right is for the use of riparian property on or overlaying the groundwater source; and whether it is for the use or storage of the water. Complicating this further is that much of California's water comes from contracts acquired from the State Water Project and the U.S. Bureau of Reclamation's Central Valley Project.[106] Within the water rights system, there are exceptions depending on the specificities of individual contracts and agreements between water rights holders, water districts, and other water suppliers.[107] This system is even more convoluted during times of drought when some water entitlements cannot be fulfilled.

The Water Commission Act of 1914 codified the appropriative water rights system and required all future diversions of surface and groundwater to be permitted at the state level by the SWRCB.[109] When senior water rights take precedence in water allocation, particularly during times of severe drought, the constitutional principle that water is to be used for reasonable and beneficial uses is sometimes overlooked.

Water entitlements in California are hierarchical. Those with the oldest claims (pre-1914) or riparian claims are awarded the highest priority in times of water shortage and drought.[110] Overlying and appropriative groundwater rights are not adequately regulated.[111]

Understanding Water Rights[108]

This brief overview of the water rights system does not detail aspects such as water trading/transfers and the role of water districts, which add further complexity to the water allocation landscape.

Appropriative Rights: Established in California during the gold rush, these water rights, codified by the Water Commission Act of 1914, gave white settlers who first diverted surface water for "reasonable and beneficial" uses in California priority water rights, known as "first in time, first in right." These entitlements can be for surface water or groundwater and can be bought and sold.

Riparian Rights: Property owners can use surface water that touches their property, as long as their consumption does not diminish the source for other users.

Overlying Rights: These give landowners the right to use groundwater from aquifers beneath their property for beneficial uses.

The 2021 and 2022 drought years have proven to be unprecedented, with state regulators announcing in August 2022 that there was no water available to allocate to thousands of senior water rights holders.[112]

This is only the third time in California's history that state regulators have enacted this type of severe water rights curtailment. Governor Newsom's August 2022 Water Supply Strategy acknowledges that the current water rights system is slow moving, archaic, and not capable of adapting to our changing climate.[113] Yet his plan lacks specifics on how the state will address the inequitable and clumsy system.[114]

With climate change intensifying, this type of restriction will likely become more common.[115] Even before the 2021 and 2022 drought years, researchers predicted that water rights curtailments in the coming decades could last 20 percent longer and occur 10 percent more often than they have previously.[116] The SWRCB cites the need to retain water in the Sacramento-San Joaquin Delta to ensure that outflows are strong enough to stave off salt water intrusion from the San Francisco Bay that would have devastating consequences for the water supply and the Delta ecosystem.[117] The Delta and the water budget are over-allocated, so even with these severe water rights curtailments, there is not enough water to go around.

Over-allocating water

In addition to an inadequate system of water allocations, California has routinely promised more water than it can deliver.[118] Water rights are currently allocated based on the expectation of water in the system, but a drought can change the amount of available water to be distributed among rights holders. Some water rights holders may not receive their full allotment because of changes in available water — a distinction known as "paper water" versus "wet water."[119] This is especially important for junior rights holders, who have a paper right to water once the senior rights holders have exercised their rights. This system can force farmers and others with curtailed rights to turn to already stressed groundwater to compensate for anticipated paper water that does not exist.[120] Reliance on the hierarchical appropriative rights system can conflict with the constitutional principle of reasonable use that would emphasize how water is used when determining allocations to rights holders.

A study comparing water rights allocations from the SWRCB to California's actual supply of water found that the state has issued rights for five times as much water as it could actually deliver based on mean annual water supplies.[121] The state acknowledges that the value of all water rights is greater than the average amount of water available.[122] Developing reliable predictions for the supply of water available in the Delta is complicated by a changing climate, complex water rights, and evolving environmental regulations.[123] When Delta exports fall short of expectations (for example, during droughts), agriculture in the Central Valley turns to over-drafted and unregulated groundwater sources.[124]

What Can Governor Newsom Do?

The governor has the power to use his executive authority and declare a state of emergency due to the impacts of climate change — from flooding to water shortages — under the California Emergency Services Act.[126] Using his emergency powers, Governor Newsom could take bold action to rein in these abuses, including halting new tree nut and alfalfa production, stopping new factory farms, and declaring these uses not beneficial by suspending sections of the Water and Agriculture Codes.[127] Additionally, the governor has the executive authority to direct the California Geologic Energy Management Division (CalGEM) to use its authority to stop oil drilling and the construction of fossil fuel infrastructure.[128]

The declaration of a drought emergency empowers the State Water Resources Control Board to enact emergency regulations.[129] The SWRCB is the executive agency with the power to make decisions regarding the flow of water within California. It can define beneficial use and reasonable use, curtail wasteful uses of water, issue emergency regulations, and exercise authority over water allotments (rights).[130] While the governor appoints the members of the board, it operates with a level of autonomy.[131]

What's more, separate rules govern the transfers of water under these rights, but the state does not actually comprehensively track these trades. This means that the whole system lacks transparency.[125]

Turning to groundwater

In addition to promising corporations more water than is available, California lacks groundwater withdrawal regulations, allowing Big Ag and Big Oil to suck up finite sources of groundwater at a breakneck pace. Insufficient surface water, lack of groundwater regulations, and advancing technology have led large agribusinesses to pump groundwater at alarming rates for years.[132] Groundwater has become increasingly important for drier regions of the state, such as the San Joaquin Valley, when surface water diversions are insufficient or cannot fulfill all paper water rights.[133] Groundwater accounts for 30 percent of water used by California agriculture in wet years, and for a staggering 80 percent of water use in dry years.[134]

When drought conditions worsen in the state and Big Ag uses more and more groundwater, sinkholes will increasingly form, and ecosystems will suffer. For example, a period of intense drought from 2012 to 2016, compounded by excessive groundwater pumping, caused the ground in parts of the Central Valley to sink almost two feet per year into empty space where water used to be.[135]

While groundwater aquifers naturally recharge over time when water filters through the soil and rock, they can take many years to recover after drought and depletion.[136] When corporations pump groundwater at unsustainable rates, rural communities, small water systems, ecosystems, and everyday Californians suffer as a result.

The not-so-sustainable Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA), passed in 2014, purports to initiate long-overdue regulation of California's groundwater. But the SGMA does not require regulations to take effect immediately, and groundwater pumping in California therefore remains largely unregulated. Prior to the passage of the SGMA, groundwater rights were based on land ownership, and the state had done little to regulate the drilling and pumping of water from underground aquifers. The SMGA recognized groundwater as a shared resource that can be regulated by the government.[137] Unfortunately, the SGMA falls short and fails to protect California's groundwater by delaying regulations until 2040, which does nothing to protect communities that currently lack or will lose access to water over the next decades.

The SGMA defines "sustainability" as avoiding six undesirable results: lowering groundwater levels, reducing groundwater storage capacity, seawater intrusion, degrading water quality, land subsidence, and depleting interconnected surface waters.[138] Yet groundwater sustainability agencies are only required to stabilize groundwater levels, not raise them. Despite rapidly depleting water sources, the law does not require agencies to fully implement their sustainability policies until 2040.[139] If the future implementation of the SGMA only stabilizes already depleted groundwater levels, California could get locked into an unsustainable system that is still in dire need of restoration.

Since the passage of the SGMA, counties have continued to issue groundwater well drilling permits as agribusinesses try to drill as many wells as they can before the SGMA takes effect and limits groundwater pumping. This has created a "race to the bottom" with serious consequences for California's precious groundwater supply. Legislation proposed in the 2022 session (California Assembly Bill 2201) aimed to address this problem but ultimately did not pass out of the legislature. It would have placed some limits on well drilling and required local governments to approve permits for new groundwater wells to ensure that new wells are in line with the SGMA groundwater management plans.[140]

The SGMA is problematic for many reasons, including the fact that large agricultural interests — with their senior water rights, organized industry groups, and connections to water districts and political networks — hold more access and influence than disadvantaged groups and communities when it comes to developing and implementing the SGMA and local groundwater policy. Meanwhile, small farmers generally lack the same power and influence and are less likely be involved in developing Groundwater

Sustainability Plans (GSPs).[141] These problems could be made worse as GSPs rely on the trading of groundwater allocations.

Currently, an estimated 250 communities, more than 800 public water systems, and over 34,000 domestic wells are located in critically over-drafted groundwater basins in California.[142] An estimated 2 million people in the state rely on private wells for their water, and 95 percent of residents in the Central Valley get their water from groundwater.[143] The groundwater sustainability agencies within these basins submitted their GSPs to the SWRCB in January 2020.

Few of the GSPs that were developed as part of the SGMA addressed drinking water access and the human right to water, even though thousands of people rely on groundwater for their basic needs and California has codified water as a human right.[144] Disadvantaged, rural, and low-resource communities face barriers to participating in the development of GSPs and are under-represented in groundwater sustainability agencies.[145] Ineffective government regulation has paved the way for industry to misuse California's limited water resources, placing a disproportionate burden on the state's most vulnerable communities.

An (Inadequate) Response: Newsom's Drought Plan Doesn't Hold Water

In August 2022, Governor Newsom released a plan that claims to prepare California for a hotter, drier future. Yet rather than take on Big Ag and Big Oil, which are driving the climate crisis and drought, Governor Newsom is promoting industry boondoggles like desalination and building massive tunnel projects to further complicate California's water system. While his plan discusses reducing water use in cities and on farms, it makes no mention of reducing the massive amounts of water consumed by oil and gas — an industry that is causing so much of the climate chaos that this plan purports to combat.[146] In fact, in other spaces, Newsom is promoting carbon capture and storage — an unproven, water-intensive technology that will extend the life of fossil fuel power plants.[147] Nor does the plan envision rolling back the other water-abusive industries like almonds, alfalfa, and mega-dairies.[148]

Wasting taxpayer dollars on desalination

For decades, private corporations have been marketing dubious desalination technology as a solution to drought and water shortages.[149] This process is incredibly expensive, energy intensive, and threatens the health and well-being of nearby communities and marine ecosystems.[150] Ocean desalination also promotes social and environmental injustice; because the process of desalinating water is so expensive, water districts that purchase desalinated water must hike rates for citizens.[151] A so-called drought solution should not further burden low-income communities with high water bills; to meet California's legal definition of the human right to water, it must be safe, accessible, and affordable.[152]

In May 2022, a coalition of water advocates celebrated a huge victory after defeating a desalination plant proposed by private company Poseidon Water (and its Canadian corporate parent, Brookfield Infrastructure Partners L.P.) in Huntington Beach, California.[153] The proposal involved converting a retiring power plant into a desalination plant that would suck up nearly 107 million gallons of ocean water per day, supposedly producing 50 million gallons of potable water and 57 million gallons of wastewater brine that would be discharged back into the ocean.[154]

In February 2022, the California Coastal Commission staff released a 204-page report strongly recommending that commissioners reject the proposal, clearly outlining how the project "would harm marine life" and place "unclear but likely significant burdens on environmental justice communities."[155] These burdens would have included rate increases in communities where their water district negotiated purchasing water from Poseidon's plant. While the specifics of rate increases were never finalized, the report stated, "it is clear that costs for Poseidon's water would be higher than other current and planned sources of water" and "the water rate hike would disproportionately impact millions of low-income residents throughout Orange County Water District's service area, the majority of which are people of color." The water district had signed a conditional, nonbinding agreement to buy desalinated water from Poseidon.[156]

The energy and monetary costs of the Huntington Beach desalination project would have been massive. Poseidon estimated that the project would have cost more than $1.4 billion between construction costs, operating costs, and the costs that public water districts would incur.[157] The Coastal Commission staff report states that the potential indirect greenhouse gas emissions would pose "significant, cumulative, adverse effects." According to Poseidon, emissions from initial electricity use and construction would be around 78,000 metric tons of carbon dioxide equivalent — the same amount produced by 16,000 cars driven for one year.[158]

The focus on environmental justice in the Coastal Commission staff report was in part a result of policy reform. In 2016, then-California Governor Jerry Brown signed a law that expanded the power of the Coastal Commission to examine environmental justice during the decision-making process.[159] Yet despite this policy and the defeat of the Poseidon project, Governor Newsom and desalination advocates continue to promote these facilities. In fact, the Coastal Commission unanimously voted to approve a facility at Doheny State Beach in Dana Point in October 2022.[160] As California continues to face severe drought and the impacts of climate change, the state should continue to reject dangerous and unjust desalination plants that are designed to make corporations money while harming our communities and ecosystems.[161]

Fighting the latest version of the Delta tunnel project

Governor Newsom is promoting a tunnel to bring more water from Northern California to support industrial agriculture in the Central Valley. This is the latest iteration of failed proposals to divert water from going through the Sacramento-San Joaquin Delta that date back to the 1980s.[162] The 2022 version would move water through a massive underground tunnel from the Sacramento River directly to the California Aqueduct — bypassing the Delta and existing water infrastructure. The State Water Project uses the aqueduct to send water south to supply farmland and cities.[163] The Metropolitan Water District of Southern California has been a major advocate and funder of the project planning process.[164] Like its 2018 predecessor, this proposal will cost billions of dollars (an initial estimate places the cost at $16 billion) and take more than a decade to complete. The tunnel would threaten the already vulnerable Delta ecosystem that is home to vital Delta smelt and Chinook salmon populations.[165] Governor Newsom must stop promoting false solutions like the Delta Conveyance Project, as it is unnecessary to meet California's water needs.

More high-stakes boondoggles: Turning wastewater into drinking water and building out storage facilities

Governor Newsom's water plan relies heavily on building out storage facilities and reusing municipal wastewater to meet California's water needs.[166] It includes streamlining the approval process for seven big water storage projects, such as the Sites Reservoir. Newsom has led the effort to revive that environmentally destructive reservoir project, which would store up to nearly 500 billion gallons (1.5 million acre-feet) by taking water out of critical ecosystems on the Sacramento River. The Sites Reservoir would be owned and operated by Big Ag interests.[167] The state also seeks to facilitate new water recycling facilities and plans to issue regulations for direct potable reuse of wastewater in 2023.[168]

Direct potable reuse — also known as toilet-to-tap[169] — relies on expensive, energy-intensive advanced treatment systems to treat sewage from cities to drinking water standards to deliver it directly (i.e., without release to the environment as a buffer) to homes for drinking and other uses.[170] Existing water recycling projects in the state release treated wastewater into environmental buffers like aquifers,[171] which can allow for additional dilution, filtration, or biological degradation.[172]

Direct potable reuse systems can be vulnerable to major failures because they lack those environmental buffers that provide more response time for corrective action in the event of equipment failures, illegal releases of toxics into the wastewater collection system, or other emergencies.[173] There is potential for the accumulation and concentration of unregulated or hard-to-remove toxic chemicals, including shorter-chain PFAS,[174] within the closed-loop systems.[175] Wastewater reuse treatment systems are also more energy intensive, can have a higher carbon footprint when reliant on a fossil fuel-driven power grid, and produce toxic brines.[176]

Overall, water recycling is about twice as expensive as traditional treatment, making it the second most expensive water supply option — second only to desalination.[177] Water conservation and fixing water leaks are the most cost-effective options for cities to manage water supplies.[178] However, Governor Newsom is prioritizing expensive, risky alternative water supply and storage projects over better water stewardship through conserving our existing supplies and stopping the abusive water practices of Big Oil and Big Ag.[179]

The Consequences: California's Dwindling Water Supply

Climate change coupled with California's bizarre and inequitable rules around water have forced communities to grapple with water scarcity.[180] Agribusinesses and oil and gas corporations guzzle millions of gallons of water, despite the state's obligation to make sure that everyone has access to water — even during times of drought.

In 2012, Governor Brown signed legislation, endorsed by FWW, to recognize the human right to water in California. That legislation established state law that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes," and that all California policy must consider this right when establishing new policy or regulations.[181] The state conducts drinking water assessments and drought and water shortage vulnerability assessments that have identified hundreds of small public water systems and thousands of domestic wells that are currently or at future risk of failing to meet the standards for the human right to water.[182]

As water shortages continue, Californians will continue to pay the price. Domestic water wells run dry more often than agricultural wells on massive farms because they are usually shallower, and homeowners may lack the resources to pay for new, deeper wells.[183] More than 2,000 domestic wells in the San Joaquin Valley ran dry during the 2012-2016 drought.[184] As of November 2022, roughly 2,400 wells in California had been reported dry in 2021 and 2022 through the Department of Water Resources' online reporting mechanism; this is likely an undercount.[185] Small and rural communities in the Central Valley often rely predominantly on groundwater, with no easily accessible backup water source or drought contingency plan.[186] Low-resource, small, and rural communities that rely primarily on domestic wells are disproportionately impacted by drought.[187] Historic and continued racism has resulted in people of color, particularly Latinx and farmworker communities, suffering the brunt of water shortages and water contamination.[188]

Water in California is also threatened by wildfires. Warmer temperatures are increasing the incidence and size of wildfires, while lengthening the fire season and impacting water sources in burned areas. These regions have more soil and stormwater runoff, increasing the amounts of sediment, nitrogen, phosphorus, and trace metals present in the water, as well as causing higher turbidity and more organic material to enter the water.[189]

Another consequence of over-promising water is the inability to maintain suitable water levels for environmental needs and for the health of fisheries. Low water levels and warm temperatures are wreaking havoc on fisheries in the Klamath River Basin in southern Oregon and northern California and in the Sacramento-San Joaquin Delta.[190] The C'waam and Koptu sucker fish, the Chinook salmon, and the Delta smelt fisheries, central to several Indigenous tribes in the region, are collapsing, and several species are facing extinction.[191]

Senior water rights holders and wealthy water districts possess a great degree of power in water allocation decisions — decisions that often ignore Indigenous communities and communities of color that were removed from their land and faced racism that limited their ability to own land and water rights. Fair allocation of water resources would ensure that Indigenous communities have a seat at the table and that the state addresses the crises of salmon extinction and water quality in the Sacramento-San Joaquin Delta.[192]

Conclusion and Recommendations

Between poor water management, water budget abuses, and historic climate change-fueled drought, California faces an unprecedented situation that requires bold and immediate action. The existing systems have failed to protect and support communities and ecosystems, instead elevating the corporate profits for those industries that only make the water crisis worse.

California's public trust doctrine states that the air, rivers, sea, and seashore cannot be owned privately but are instead dedicated to the use of the people.[193]

Water is a common resource and a human right. The state must improve its water regulations and management systems in accordance with the public trust doctrine and the human right to water to stop ongoing corporate water abuses, guarantee water access for all people, and protect the public's interest and well-being.

Food & Water Watch recommends:

At the state level:

- Stop egregious misuses of California water. Governor Newsom and the SWRCB should:
  - Declare using groundwater to grow almonds and alfalfa in the southwest San Joaquin Valley a "waste" and not a beneficial use, and stop new almond and alfalfa planting in the region, while providing assistance to help small growers transition to more sustainable and less-thirsty crops.
  - Ban new mega-dairies and the expansion of existing ones.
  - Place an immediate moratorium on new oil and gas operations in California.
  - Swiftly transition to 100 percent renewable electricity generation like solar and wind.
- Improve water management regulations and practices by defining all water, including groundwater, as a public trust resource, not a commodity subject to resource extraction at the expense of the public.
- Improve the transparency of water rights transactions, including prices, volumes, and regulations.
- Respect the water rights of Indigenous communities, actively consult with Indigenous communities on water rights and best water management practices, and prioritize state support to disadvantaged communities experiencing water shortages.
- During the implementation of the SGMA, ensure that groundwater agencies and Groundwater Sustainability Plans reflect the needs of all stakeholders, centering vulnerable communities and small and rural water systems as codified in California law. The human right to water must be discussed in GSPs.

- Pass legislation through the State Legislature to curtail groundwater pumping and protect the human right to water during the implementation of the SGMA. Sample bills would include AB2201.
- Declare mandatory conservation measures across the state, limiting indoor water consumption to 42 gallons per person per day to get closer to the standards set by 2022 Senate Bill 1157.
- Reject public subsidies for water projects that support ocean desalination projects and the wasteful water practices of Big Ag, and reject false solutions like the Delta Tunnel Project.
- Prioritize locating and repairing leaky water pipes as the state's water infrastructure continues to age. California cannot afford to waste the water that it has.

At the federal level:

- Pass legislation — like the federal Water Affordability, Transparency, Equity and Reliability (WATER) Act — to fully fund our water and wastewater systems, put water systems back in the control of the public, help ensure water access and affordability, and restore the commitment of the federal government to protecting water.

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