

Is California Agriculture Prepared for Another Drought?

- Questions for Lenders and Investors -

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California is the largest driver of US agriculture, and water is the foundation that it sits on. This finite resource is the pen that writes the success story of the agricultural economy and California's massive crop output capacity, and that pen is running out of ink.

The last major drought that parched California peaked 6 years ago in 2015. A high demand for food, driven by an increasing world population¹, raised the agricultural demand for water². This, amid a warming climate, lessened snowpack, groundwater over-pumping, and short-sighted investments, exacerbated California's five-year drought, from 2012-2016.

It caused allocations to drop, issues for water-intensive crops such as almonds, sparse groundwater basins, wildfires, and increased cost of obtaining that groundwater³. It also damaged local ecosystems, the health of which is important to successful agriculture⁴.

Recent news reports that the United States Bureau of Reclamation (USBR), whose south-of-Delta allocation declarations for agricultural water service contractors sit at just 5% of what was requested from water contractors in California, will not be delivered until further notice.

What's more, the California Department of Water Resources (CDWR) has decreased projected California's State Water Project (SWP) allocations from 10% to 5%^{5,6,7}. This situation shows both federal and state actions that are precursors to drought.



A notable effect of the drought and these changes in allocations is the increase in value of water on the Nasdaq Veles California Water Index. Values increased “nearly 30% from approximately \$530 per acre-foot to \$686 per acre-foot”⁸.

Learn from history. These water allocations are reminiscent of the numbers seen in the most recent period of extreme California drought. The last time allocations were at 5% of requested amounts was in 2014, right before the height of the 2012-2016 drought. Now, the alarm-raising allocations projected this March of 2021 and well-below-average snowpack⁹ are indicators that this year may see another vicious drought that will perhaps be only building to its peak.



Agricultural finance institutions are, in multiple ways, leaders of the agri-food economy. The decisions regarding where and to whom to lend and invest funding can initiate shifts in the agricultural space.

The time must be now for agricultural lenders to act on these facts. In the face of this drought, they can take steps to lessen the financial, natural, and social risks that will arise if proactive measures are not implemented.

Be proactive.

Identify, understand, and monitor water risks in the context of drought. Learn how these risks will impact each unique business case and portfolio so that the associated business risks can be mitigated. Water risk mitigation starts with data.

Are Agricultural Finance Institutions Prepared for A Repeat of the 5-Year Drought?

Identify, Understand, and Monitor

Are agriculture lenders and investors prepared to confront another serious drought? Moreover, are the borrowers in their portfolios ready and equipped for one? ***If they aren't, how can the lender help them reach a point of readiness so that financial risks in both parties can be mitigated¹⁰?***

Agricultural finance institutions can start by recognizing whether or not their business has the capability of identifying and understanding business risks that will stem from another drought.

This entails having access to resources that compile, compare, and present data regarding:

- » Water districts
- » Water rights
- » Groundwater access
- » Water quality
- » Soils
- » Operational information
- » Surface water access
- » Ownership
- » Financial information, and more

What are plans B, C, and Z?

- » *Developing a drought resilience plan must start with data. Without having a holistic view of granular data - meaning, understanding how multiple granular datasets interact with each other to form a comprehensive picture - drought resilience plans are shots in the dark. Data helps businesses make decisions for the various unique risk scenarios in their portfolios.*

Is it clear where each property in a portfolio is getting their water?

- » Are a farm operation's sources of water - be it water contractors or SGMA priority basins - at high risk from drought?
- » What is the demand for water throughout a portfolio? What are the crop-specific water requirements? Water stress (when demand for water exceeds supply) is no stranger to California and becomes a bigger problem as drought increases.

Is water actually going to arrive this irrigation season?

- » Are there parcels and farmlands in a portfolio that are in water districts which are at risk of not having water delivered?
- » Are there banked water resources that can be drawn down?

How do local supplies look in light of SGMA?

- » Are there pumping restrictions in place within the GSA? Pumping restrictions coupled with drought can cause risks through increasing stress on crop production output.
- » How reliant are a portfolio and specific properties on groundwater? If a portfolio, or properties/parcels in a portfolio, are highly reliant, is there a plan for when those supplies are limited? Is the water budget for the property known? Certain crops demand more water, as do various irrigation methods. If a property in a portfolio relies mostly or only on groundwater - a diminishing resource in California - while also yielding water-intensive crops, there is likely to be risk.



This situation can be seen as a growth opportunity for the longevity of a loan or investment's return, the lender-borrower relationship, and the financial institution's role as leaders in the space. In the face of drought, improvements can be made and proactive measures can be taken with the support of the lender's stewardship of the borrower. ***Assistance with transitioning to more water-conservative methods¹¹ can improve the ROI of both the borrower and the lender and is the clear path forward through the hardships of drought to emerge resilient on the other end¹².*** Investment in more sustainable water practices in agriculture contributes to resiliency in both bottom lines and the greater agriculture space. Finding common ground over consistent data that AQUAOSO's platform provides makes progressing these crucial relationships far easier and quicker.

» Can land be fallowed to move water to more profitable crops?



Letting property go fallow to regenerate soil health while making the economic decision to keep the crops that are worth more alive can be a practice utilized in resilience strategies. Alongside the carbon sequestration properties of healthy soil, the benefits of healthy soil in agricultural water conservation are substantial¹³; this is a good advantage to have during a drought and with sparse water allocations.

Incorporating regeneration initiatives into the choice to fallow land, while also moving water to irrigate crops elsewhere and maintain economic momentum, can help to maximize the utility of the allocated water and be an investment in properties that will have healthier soil in the future^{14, 15, 16, 17}.

» Are there new programs like groundwater recharge and credits, water transfers, and water banking that can act as a hedge against cuts to groundwater supply? Does the property owner have a well share agreement or other partnership for sharing water resources?



Creativity in proactivity, utilizing professional relationships, and using shareable data can not only help agricultural stakeholders minimize risk, but also pave paths toward industry-wide competitive drought resilience. Recognizing available water resources and comparing them to crop-specific water requirements can give support and substance to resilience strategies. Finding the answers to these questions regarding available water resources in the context of relevant datasets (which would give more complete pictures of a situation) can be a process that leads to elusive results. ***The starting point to this strategic process to reach economic durability during a drought - finding feasible and practical recharge programs¹⁸, water banking, and more - must start with comprehensive and granular datasets that give explorable, geospatial representations of relevant context for portfolios.***

» Are properties in a portfolio in an adjudicated basin? If so, has the watermaster issued reductions in allocations for the groundwater basin?



Seeing geospatial, granular data holistically as it impacts specific portfolios can be a foundation for resilience strategies. Reductions in allocations can put affected parcels at risk during a drought.

Will there be enough groundwater to sustain the operations in a portfolio?

- » Are there parcels in a portfolio that reside in SGMA priority basins and/or locations where the drought will hit hardest? It is crucial to understand GSPs as well as the groundwater limits and availability across a portfolio. AQUAOSO provides simplified, portfolio-specific GSP summaries and drought-related risk data.

Are there junior water rights associated with a portfolio that are at risk for curtailment? What types of water rights are associated with the portfolio?

- » *Junior water rights are further down the line in terms of water delivery than senior water rights, so understanding how the water rights associated with a portfolio align with delivery holds and allocation reductions, as well as other drought-related risks, is important in preparation for drought.*

Do the farmers, water districts, and municipalities associated with portfolios have water banked?

- » *Banking water in groundwater reservoirs during times of excess, unused water so they can withdraw it during droughts can provide agricultural operations drought resilience. This practice can also help recharge natural groundwater basins, contributing to the restoration of ecological health.* It is important to remember that healthy ecosystems - which include water, soil, biodiversity, etc. - should be regarded as natural capital¹⁹ because they can contribute to the financial success of farming. Examples include the success stories of the Regenerative Organic Alliance²⁰.
- » Is there evidence of the water banking contracts? Access to these contracts is beneficial because they give insight into how much water a property or group of properties has access to. Contracts also tell when that access is active.



Mitigate

There are a lot of components that aggregate to form water risk including water districts, water rights, groundwater access, water quality, soils, operational information, surface water, ownership, financial information, and more.

The trick is compiling and organizing granular data for these different aspects to understand water issues' impacts on individual parcels of land, unique businesses, and portfolios. In the end, what will make the difference in mitigating water risk and returning to water resilience - and therefore stepping toward financial security during a drought - is granular, shareable data that is representative of the real, on-the-ground situation.

AQUAOSO exists to provide this data to help answer many of these questions as well as provide workflows to assist in increasing a portfolio's resilience. Financial success for the agriculture economy during the period of drought that the western United States is seeing will require proactivity and collaboration over granular data. Having access to the right water data can be a catalyst for proactivity.

To build professional relationships that will lead to water resilience and less risk, there must first be un-siloed, common ground.

That common ground, from 2021 into the future, is data.



Accessible, granular data is the new norm. Having access to the complete picture at multiple resolutions is an immense benefit to financial institutions and other stakeholders in terms of truly understanding water risk. This advantage becomes increasingly prevalent during times of drought, water allocation reduction, climate change, and curtailment.

Agriculture lenders and investors possess a unique power to drive where the industry goes through relationships with their borrowers²¹. Not only can financial institutions reduce water risk, but they can also be leaders in water resilience by building relationships with borrowers to encourage and empower them to implement sustainable water practices.

As lenders, investors, growers, and other agriculture professionals make the transition to digitization, AQUAOSO is here to do our part in adding that accessibility to water data.

AQUAOSO

Granularity in data is key



The [Research and Reporting Tool](#) in our [Water Security Platform](#) is the first map-based SaaS platform for advanced water and land data by parcel and/or group of parcels.

The [Portfolio Connect Tool](#) allows users to automate geospatial data management and information collection workflows through real-time data connections and analytics for your entire land, customer, or membership portfolio. This data can then be securely shared between stakeholders such as investors, lenders, growers, co-ops, and insurance companies.

Water expert [Peter Williams says](#) about the Water Security Platform,

“Users can now assess the complete water risk situation for a given parcel – water rights status, groundwater availability, supply variability, crop requirements, historical situation, and trends. What might once have taken hours now takes a few moments... AQUAOSO represents a compelling example of the dynamics of big data and how it really adds value through ‘drilling down’ to ever greater levels of granularity, before aggregating back up to larger scale insights”

Endnotes

- 1 [“Global Demand for Food Is Rising. Can We Meet It?,”](#) HBR
- 2 [“Water in Agriculture,”](#) The World Bank
- 3 [“Drought Impacts on California Crops,”](#) USDA
- 4 [“Natural Capital and Its Role in ESG Risk Mitigation,”](#) AQUAOSO
- 5 [“California State Water Project initial allocations lowered,”](#) The Sacramento Bee
- 6 [“Continued dry conditions prompt early warning about potential water shortages,”](#) California Water Boards
- 7 [“Reclamation updates Central Valley Project 2021 water supply allocation,”](#) United States Bureau of Reclamation
- 8 [“California Water Project Allocations Drop; Nasdaq Veles California Water Index \(NQH2O\) and Futures Jump Nearly 30%,”](#) WestWater Research
- 9 [“Dry Conditions Continue Even as Recent Winter Storms Bring Much-Needed Snow,”](#) California Department of Water Resources
- 10 [“Sustainable Water Practices Can Be Driven With Ag Lending Relationships,”](#) AQUAOSO
- 11 [“How to Conserve Water in Agriculture,”](#) AQUAOSO
- 12 [“How Sustainable Agriculture Investment is Linked to ROI,”](#) AQUAOSO
- 13 [“The Relationship of Soil and Water,”](#) AQUAOSO
- 14 [“The Importance of Biodiversity to Food and Agricultural Systems across the Globe,”](#) World Food Prize Foundation
- 15 [“Shaping land use change and ecosystem restoration in a water-stressed agricultural landscape to achieve multiple benefits,”](#) The Nature Conservancy, California Conservation Science
- 16 [“The Role of Biological Diversity in Agroecosystems and Organic Farming,”](#) IntechOpen
- 17 [“Nature’s sleeping giant,”](#) Natural Climate Solutions
- 18 [“Groundwater Recharge – Its Importance and Scalability,”](#) AQUAOSO
- 19 [“Natural Capital and Its Role in ESG Reporting,”](#) AQUAOSO
- 20 [“The Relationship of Soil and Water,”](#) AQUAOSO
- 21 [“Sustainable Water Practices Can Be Driven With Ag Lending Relationships,”](#) AQUAOSO