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Groundwater Issue

Markets, Banking,
Water Quality

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E.J. REMSON

The Nature Conservancy

A First-of-its-kind Groundwater Market in Ventura County, California May Just Be a Model for the State

BY PENELOPE GRENOBLE

E.J. Remson, The Nature Conservancy, Matthew Fienup, California Lutheran University and Edgar Terry, Terry Farms.

THE FOX CANYON GROUNDWATER MARKET, California's first formal centralized groundwater market under the 2014 Sustainable Groundwater Management Act (SGMA), is a unique partnership between a groundwater management agency, a local university and an organization best known for environmental conservation. California Lutheran University led the effort to organize and structure the market; Fox Canyon Groundwater Management Agency (FCGMA) passed the ordinances that authorized a pilot to test the strategies and administrative structure the university helped develop; and The Nature Conservancy secured an \$800,000 National Resource Conservation Service (NRCS) grant to subsidize the advanced metering structure (AMI) that has made it possible. Here, E.J. Remson, The Nature Conservancy's Senior Program Director, talks about how it all came together.

SOURCE: How would you describe the market?

REMSON: It's essentially a cap-and-trade system built on matching the highest amount someone is willing to pay for water with the lowest amount someone is willing to sell it for. An algorithm matches them up. Groundwater becomes an economic asset, increasing conservation and water use efficiencies. Growers have the flexibility to adapt to uncertain or declining availability and can use their water for purposes they consider the most valuable.

SOURCE: What caused The Nature Conservancy to become involved?

REMSON: It's a great laboratory in which to engage. The Santa Clara River runs through the basins FCGMA administers. For the past 18 years, we have been securing land in the area to preserve the river ecosystem and protect threatened and endangered species.

Ventura County is the eleventh most productive agricultural county in the country — no small player in the agricultural

WHY ALGORITHMIC MATCHING?

ALGORITHMIC MATCHING is a way to reduce transaction costs, eliminate market power and maximize gains from trade. Prominent examples include smart computer-assisted markets proposed by Vernon Smith (early 1990s) and smart markets for water allocation proposed by John Raffensperger (early 2000s). **Algorithmic matching** had broad appeal among Fox Canyon growers because smaller growers worried that the largest operators and the multi-national packer/shippers would exert market power and extract all the gains from trade.

Small- and medium-sized growers saw **algorithmic matching** as providing them an equal opportunity to benefit from trading.

Agriculture uses 57 percent of Ventura County water and two-thirds of that supply comes from groundwater. Photos courtesy of Ventura County Farm Bureau.

world. The Nature Conservancy owns 500-600 acres of agricultural land there that will eventually be restored, and as landowners we are also pumpers.

SOURCE: The Nature Conservancy is known for pilot programs and a market-based approach to conservation. Did that interest you here?

REMSON: Historically, groundwater has been a challenging resource, in part because it has been an invisible one, but it is fundamentally important for both people and natural systems to remain in balance. Plus, we were interested in the basin's Groundwater Sustainability Plan (GSP).

Because we were involved in the

development of SGMA, we understand the importance of the GSPs being solid and successfully implemented. In places like Fox Canyon, where there will be significant reductions in pumping over time, implementation is going to be a challenge. The groundwater market is one really good tool to do that. Our strategy is to submit an early GSP to the Department of Water Resources that can be a model for other Groundwater Sustainability Agencies (GSAs) around the state. We're also on the edge of one of the world's largest metropolitan areas, and agriculture is a much better neighbor to us than suburban sprawl.

SOURCE: How did the market evolve?

REMSON: The Water Market Group, including us, FCGMA and interested growers, was based on an original Growers Group and was co-chaired by economist Matthew Fienup at California Lutheran University and Edgar Terry, president of Terry Farms. The group developed the vision for a market and its administrative rules. When the group recommended a water market, FCGMA passed an ordinance authorizing a pilot project. The fact is there's no book on how to do this. For the market to work, participants have to trust the system that there won't be any fraud or issues like that down the line.

SOURCE: This has been billed as California's first groundwater

**water market under SGMA.
Is that accurate?**

REMSON: Other groups are talking about doing a groundwater market as part of their GSP, but so far nobody has done it in the formal, secure way that is being undertaken by FCGMA, where there are trading rules and pricing is available.

SOURCE: What are The Nature Conservancy's concerns?

REMSON: Our primary concerns are that the market fairly implements the rules developed by the Water Market Group — who can trade, what can be traded and when, the bidding procedures and reporting rules. The GSP is required to consider groundwater dependent ecosystems, and we wanted to be sure that the water market didn't negate any of what we were working on in the plan.

It turned out to be a lot more work than we anticipated. Massaging years of FCGMA data to work with the water market pilot was difficult. Evidence of under-reporting in the past generated the need for advanced metering. This required selection of a vendor, development of a data portal, installation of meters on all wells in the basin and protocols for who would own and maintain the wells. Imagine you're a pumper and you're got to put AMI meters on all your wells at a cost of \$3,000 for each well.

SOURCE: So, the NRCS grant was critical?

REMSON: The grant provided money to help subsidize installation of the meters and FCGMA matched it. Eventually it was established that the pumpers would own and maintain the equipment.

SOURCE: What challenges should other GSAs considering a groundwater market be aware of?

REMSON: The workload. FCGMA is sized for the routine work of monitoring and administering the rules of the groundwater basins it manages. SGMA and the development of the GSP put a strain on these resources; developing the water market added a new load.

Pumping allocations were the most contentious factor we had to deal with. If

you're going to have reductions or control the amount of extractions, you've got to have an allocation system so people know how much they have to trade. Many engaged pumpers suggested different types of systems, which fundamentally boiled down to a proportional allotment, whereby everybody gets so many acre-feet of water per acre or each pumper gets a percentage of its average historic use. Eventually the ordinance was written with the allotment based on historic usage

WHAT'S AT STAKE?

Fox Canyon Groundwater Management Agency manages groundwater extraction

on approximately 50,000 acres.

2 basins are in critical overdraft.

Growers could face up to 40% cuts by 2020.

Agriculture uses 57% of Ventura County water and 2/3 of that supply comes from groundwater.

over a 10-year period ending in 2014, the year SGMA went into effect.

SOURCE: Are there other challenges associated with allocations?

REMSON: There are two — carrying over unused allotments and borrowing forward. Carrying over allows growers who don't use all their allocation in one year to bank that amount over to the next year to either use or sell. We thought that was fair because it encourages people to save. Maybe they'll change their crop type or invest in more efficient irrigation technology. If you look at the total volume that could be pumped over the next 20 years, carryover will never allow that to be exceeded. The growers are only using what they've saved.

Borrowing from yourself for the

future would allow growers to pump more than their annual allotment, banking on the fact that they can make it up in a wet year. They go into water debt.

Say you're a farmer growing the same crop as your neighbors and there have been some dry years; you're up against the wall with your allocation. All your neighbors are betting on a coming wet year, so you're also going to borrow. If the wet year doesn't happen, there are going to be nothing but buyers in the market and no sellers. The only way to repay the water debt would be to fallow ground or pay very high penalties. If a number of growers did that, it would be a disaster for the basin, the growers and FCGMA, which wouldn't be able to meet its GSP goals.

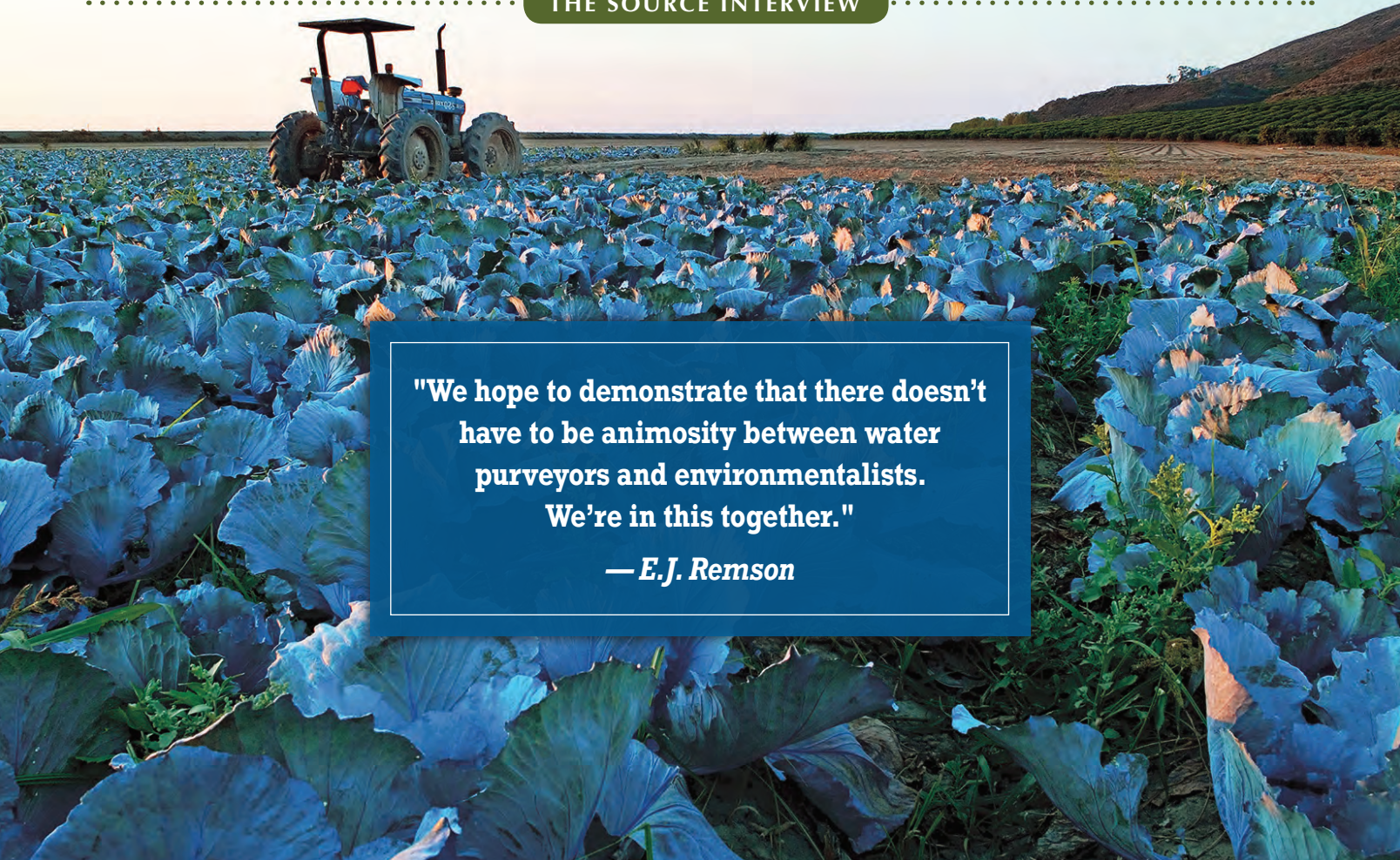
Eventually it was decided that carryover would be part of the allocation system but borrowing forward would not.

SOURCE: What happens in a wet year when no one needs water?

REMSON: The market will fluctuate, which is what you would expect. Some growers who might have been thinking of putting in a new crop like fruit trees, which need a lot of initial water, may decide now's the time when water prices are low. Without a groundwater market in a dry year, fallowing land because of insufficient water could destroy a farmer. The water market provides farmers a way to achieve some economic relief. One grower decides to plant and wants to buy water. Another can sell his water and fallow that year, taking the income from the sale of his water.

SOURCE: Do you foresee that market membership will expand?

REMSON: I can see a day when municipalities, industrial users and environmentalists will be allowed to participate. Say we have a long-term drought with the water table going down and cities hitting their limits. Instead of spending millions of taxpayer money to bring in alternative sources of water, they could go to the market and buy however many acre-feet they need, which would be cheaper and more equitable than spending millions of dollars on infrastructure that is only needed during droughts, or



**"We hope to demonstrate that there doesn't have to be animosity between water purveyors and environmentalists. We're in this together."
— E.J. Remson**

cutting farmers and giving the water to cities. Ultimately, we hope that other environmental organizations will be able to participate even if they don't own land or aren't pumpers. If, for example, you had a restoration project that needed to pump water for three years to get plants established, you could go to the market and buy water. Or if your goal was to keep the water table high, you could buy water on the market and leave it in the ground.

SOURCE: What else should someone considering a groundwater market think about?

REMSON: Data analysis is critical to evaluating how well the market is working as a tool to implement the GSP. If there's no trading or very little trading, although it appears that there's demand for water, is there something in the way the market is designed that is making growers not want to participate? The

goal of a pilot is to work out the bugs. The data will help us do that.

SOURCE: Can the challenges of developing this market be extrapolated to other water markets?

REMSON: What we faced is going to be typical, if not even more difficult in other areas. FCGMA has been administering the basin for more than 30 years. Think

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about the GSAs that are just being formed and trying to prepare a GSP, developing a stakeholder input process and then adding a groundwater market on top of that. We're hoping to use the benefit of our experience for other agencies interested in this model.

SOURCE: How important was it that outsiders were involved?

REMSON: California Lutheran, a local university that's trusted and has experts and economists, performs the role of a third-party non-government administrator, which the growers wanted. The Market Group, including the 50-80 pumpers who have participated and FCGMA, has been very progressive, and The Nature Conservancy securing the NRCS grant was very significant. We want to get the word out — 'Here's what Fox Canyon worked out, so you don't have to.'

In the Fox Canyon basins, where everybody will be ramping down 30-40 percent over the next 20 years, the market is going to play a more important role. We hope to demonstrate that there doesn't have to be animosity between water purveyors and environmentalists. We're in this together. 💧

For more information on California's first water market, see www.fcgma.org.



Penelope Grenoble is the former editor of SOURCE Magazine.

Water Loss Audits Deadline Fast Approaching

OCTOBER 1, 2019 MARKS THE THIRD YEAR that validated water loss audits are required of all California urban retail water distribution systems for compliance with SB 555.

Are you ready?

Download the AWWA Free Water Audit Software today to get started. It's never too soon to pull your water loss team together, review actions taken to date to reduce non-revenue water and develop your system's water loss control plan.

Audits submitted after June 30, 2019, must be validated by a CA-NV AWWA Water Audit Validator (WAV) certificate holder. Water Loss Audit information and a list of current WAV certificate holders are posted on the Section's website. 💧



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