Almonds and Lawns

https://www.climateone.org/audio/almonds-and-lawns
Recorded on July 1, 2015

Greg Dalton: I'm Greg Dalton. And today on Climate One we're talking about almonds and lawns. The fierce California drought has sparked a debate about the landscaping in our yards, the food in our kitchen and our bathroom habits. Californians are conserving water but is it enough? Will the drought permanently change our California lifestyle?

Over the next hour, we will talk about agriculture, cities, public opinion and what officials are doing to prepare for a dry 2016. We also will talk about the connection between burning gasoline and other fossil fuels that scientists say is making the drought even more harsh. We're joined at the Commonwealth Club today by four leaders in California water. Ellen Hanak is water director at the Public Policy Institute of California; Felicia Marcus is chair of the California State Water Resources Control Board; Paul Wenger is president of the California Farm Bureau Federation; and Marguerite Young is board member at the East Bay Municipal Water District. Please welcome them to Climate One.

[Applause]

Greg Dalton: Felicia, I'd like to ask you, begin with you, droughts come and go. We're used to droughts in California. Is this one different or this is like another cycle we ride it out, tighten our belts for a little while, and then we go on with our lives?

Felicia Marcus: Oh, this is the biggest wake-up call in modern times. This is the worst we've had. There have been some years that may have technically had a little more precipitation.

But we haven't had one where we also had so much heat that we lost our snowpack, which is a third of storage on average as it refills reservoirs and replenishes surface waters. We also have millions more people dependent on that water than the last time we had a big one in the 70s or in the 20s. We've got more agricultural production dependent on every drop precisely because ag has become more efficient and can produce more with every drop. We have more endangered and threatened species than we've ever had before who can't deal with droughts the way they could in nature, either because they're so weak and depleted or because we've altered their habitat so much that their refugee is gone. So it's serious on just about every front you can think of.

Greg Dalton: I need a drink after that. Okay. Ellen Hanak, you survey California population attitudes. Where are Californians on this? Do they recognize the severity of the drought? Are they changing their behavior?

Ellen Hanak: So I think one of the interesting, most interesting questions that gets asked in the PPIC statewide survey is a completely open-ended one that just ask people, what is the biggest -- what's their top issue for -- what do you think the top issue is for California? And just to give you a sense of how much things have heated up in the public mind, last May, so May 2014, already after the emergency declaration, 14% said that water or drought was the biggest deal, but the economy was still a bigger deal for them. As of just last month, this past May, it was 39% that said water or drought. It is just unheard of that Californians think that's such a big deal. And so I spin this in an opportunity kind of way, saying that this is a real chance for people to kind of heed the wake-up call and really make some changes that we need to make for the long-term.

Greg Dalton: Paul Wenger, farmers obviously live and die by water. They know it's a big deal. What's the impact on California's agriculture economy right now?

Paul Wenger: Well, it's a huge impact because we do, a lot of folks, might grow almonds and walnuts. I'm a third-generation of Modesto just over the hill. Two of my sons farm with me. When grandpa came here in 1910, he was milking 70 cows by hand. We went into raising dairy beef for folks to put in their locker and we watch the markets. The markets today are almonds and walnuts, and so we're almonds and walnuts. And a lot of other people are not surprisingly driven to walnuts. Nobody cared about being a walnut grower when my dad was getting 15 cents a pound and we were getting 50 cents a pound for our almonds. But today, as we're into a global marketplace and we're seeing the middle class is growing at phenomenal rate around the world, they are beating a path to our door here in California.

Greg Dalton: And we'll talk a little more about almonds and hedge funds and other things later. Marguerite Young, some people might say, "Well, I tightened my water use last time and I may have been punished for it." So tell us about how this time is different in terms of what you've learned to try to drive conservation and not penalize people who do conserve?

Marguerite Young: The fact is that when water is scarce, it still costs urban utilities the same amount to put the water to customers' homes. So prices inevitably are going to need to increase. At East Bay MUD we've instituted a 25% drought surcharge. What we're asking that's on the amount of water that they use. So if you use less, you're still going to get the surcharge but it will be much less. What we learned from the last drought in 2008-2009, we had an allocation system that made it very difficult for people in large households who were conserving. Today --

Greg Dalton: Does that mean allocation system means X gallons per --

Marguerite Young: X gallons per household or you pay more.

Greg Dalton: Okay.

Marguerite Young: So now we have a tiered -- our regular three-tier rate system, the drought surcharge of 25% on top of that. And what we're telling people to do is use 35 gallons per person per day inside, and then follow the outdoor watering restrictions.

What that will mean is that some people don't need to do a thing. In fact, they're already doing better than that, far better than that. And some people will need to do much, much more. Our customers are using 1,000 gallons per household per day. We're looking to them to really cut back a lot.

Greg Dalton: Let's talk about outdoor landscaping. A lot of the water use is outdoors. Felicia Marcus, I remember you saying one time that, as Americans moved west from the Midwest where there's abundant water, we replicated the kind of rolling lawns that people enjoy in Michigan. My family moved to California in the 60s from Michigan and put a lot of effort into getting a little patch of lawn on the front yard because that's what people did. That meant the sort of middle-class lifestyle. Are those days over, lawns in California?

Felicia Marcus: Well, it depends on the lawn. I think bright green lawns even in the drought maybe not so great, not necessary. Increasingly, people are lining up like mad to get the turf rebates that many communities have put out to make it easier to transition to a more drought-tolerant landscape. In many cases, again --

Greg Dalton: Three dollars or something for a square foot?

Felicia Marcus: In L.A., it's pretty good because it's a $2 and they add $1.75 and it varies around the state. But they recently start out to be an $8 million program a year, then it was 20 during the drought. They had so much demand they took it to 40, then to 80, and they just went for 350 for a game changing sort of moving it and that's because of public demand. So, in many cases, people have also, "The lawn came with the house." It doesn't have the same meaning for everyone and many people didn't realize that there are different kinds of lawns. You can put in native grasses that don't take as much water.

And frankly, people routinely overwater. That's what we found is that the people are routinely over watering their lawns, figuring more is better, instead they are watering the three feet under their lawn. A lawn is actually pretty hard to kill. It may turn brown out of season, but it will come back once it rains. I mean, obviously, the permanent transformation if folks aren't in love with their lawn is a better way to save. Because folks use 30%, 50%, sometimes 80% of residential water uses outdoors and that's hardly the most important thing. It's that indoor public health and safety, being able to water your trees. Trees are important. I always say, if you have a little lawn in the backyard so you can play ball with the kid and they can fall down, that's a functional lawn. It just doesn't have to look like St. Andrews all the time.

Greg Dalton: Actually, I was watching the U.S. Open recently and a lot of the fairways - I think it was in Washington state - were very, quite brown. It was a whole different thing. It looks different on TV. I think it's a sign of things to come. Marguerite Young, East Bay lot of lush landscapes out there in the East Bay. How are the lawns doing?

Marguerite Young: Well, we have a very ambitious turf replacement program. Last year our customers replaced half a million square feet of lawn. This year, we're on a pace to replace one and a half million square feet of lawn and our rebate is much more modest, 50 cents a square foot. We will be looking at whether that should go up, but right now there's enough motivation that we can barely keep pace with the rebates for processing. We also have rebates to help people keep landscape by gray water use, taking your laundry water and moving it out into the garden.

Greg Dalton: Let's talk about gray water. It used to be illegal in some places because health concerns about standing water and disease and mosquitoes and that sort of thing. Ellen Hanak, is gray water is that something Californians are ready to accept? It's kind of cutting-edge.

Ellen Hanak: I think it is. I think it's also worth kind of keeping it in perspective though too. Because to some extent, in a place where that gray water would just be going, so you runoff from your shower or from your dishes, if that was just going to the wastewater treatment plant and then going out into the ocean, then yeah, it's wasted water and it's not being reused. But more and more urban systems are developing ways to reuse their treated wastewater and then that can be quite efficient to just have that gray water go into that system and be reused and redistributed. So it's not always lost.

Greg Dalton: It depends on where you live.

Ellen Hanak: Exactly.

Greg Dalton: Paul Wenger, recycling water in agriculture, is that happening? Think of all those flooded fields, flooded irrigation out there.

Paul Wenger: Yes, that's recycling because it goes to the system; those molecules of water don't go anywhere. In fact, we've conserved our way into this problem and where in the past we had a lot of our sandy loam soils. University of California would even tell you that on a Hanford sandy loam, if

you flood or irrigate, 30% to 40% of that water is used by your tree, if it's a treeless, if it's a corn plant or an alfalfa plant. Once it's below the red zone, it's in the bank. It's in the soil profile and it's sitting there waiting for rainfall or other things. It's not going to be there for the sun to evaporate it, it's sitting there. It doesn't go anywhere. Those water molecules are filling that soil profile.

What we've done today is we have spoon-fed through micro-irrigation which is good to help us conserve, but I haven't seen anybody conserve their way to plenty. We have to talk about the dialogue. The dialogue has to go to 39 million people in the state of California are surviving on water infrastructure designed for 18 million people. And so we can conserve our way through dry times, we've done it before. But a lot of folks say, "Oh, when you flood irrigate a field, you're losing that water." I'm banking that water in the ground. That's where the groundwater comes from for wells and so we are recycling.

Like, I like to tell folks that were in the valley, we live on it and we have a well. And so on the septic system so we pull the water up, we drink it, we flush the toilet, we do the shower, it goes to the leach line, it goes down. My kids live a mile to the west of me, they pick it back up in their pump [Laughter]. They shower on it. They drink it. They flush the toilet.

Greg Dalton: It's kind of inheritance of sorts like that.

Felicia Marcus: There's this magic touch of nature somehow in between.

Paul Wenger: But it works. It goes to the soil profile.

Felicia Marcus: Yeah, soil.

Paul Wenger: And that water recycles and is completely being reused.

Greg Dalton: Let's talk about groundwater, big deal in California. There's been a lot of press lately, Felicia Marcus, about over pumping of groundwater, sinking levels, that's what sort of drawing on our banking, our savings account for the future. Is California over drafting its groundwater supplies?

Felicia Marcus: Well, it depends on where you are. It's hard to do anything across the board in California because it's different depending on where you are. Certainly there are some basins that are over drafted, but it's there for drought. The drought legislation, the historic drought legislation that we got passed last year is to prepare for future droughts, not to cut off the support during this drought. I mean, I think well-managed groundwater basins - and there are many in the state - make plans to make deposits in that water bank, so to speak, during wet years. They let it seep in, they let extra seep in so that it's flush during a dry year. That's the way you manage a groundwater basin.

Well, there are some areas that have had, in some ways, a run on that as people have sunk deeper and deeper wells. You are having essentially like an arms race with wells where you had the guy with the biggest pump winning and you're starting to say, it's not an environmental issue necessarily. You started to see neighbor versus neighbor, wells running dry and I think that created a fair amount of interest in figuring out how to get ahead of that curve. The legislation gives tools to locals as well as certain metrics to do it over time. But you are going to draw down a groundwater basin in the time of drought to avoid economic and human hardship, but you got to repay the bank.

Greg Dalton: Paul Wenger, there is an arms race with drilling in the Central Valley and the sort of "use it today, worry about it tomorrow" mentality. Are some of the farmers putting themselves in a tight box and say, "I better use it because if I don't use it, you're going to use it?"

Paul Wenger: I don't think that's really the case. I know we say, "Just use it, never lose it mentality." There is that but ironically some of it comes from the government. I know over in the Modesto Stanislaus County area, Oakdale Irrigation District has been called on the carpet for selling water they had at New Melones reservoir and selling that to other people and then pumping groundwater. But if they don't use the surface water, they lose it. But that's a mandate from the government telling them, "You have an allotment for this year of surface water, if you can't use it, then you're going to lose it. So what are you going to do?" You're going to sell it and you're going to pump groundwater.

So when government tells you sometimes you shouldn't be doing something, why don't you take a look at who's causing it. We know that if we over water our trees, our plants, they'll die. It's from fungal diseases, pythium and phytophthora, and other things. I don't think anybody wants to drink more water than what you would need and it's the same thing with our plants. They can't get up and run off. So today, we can monitor. We do leaf analysis where we put a pressure bomb on a leaf to see how much the pressure of retention of the water in the leaf to find out. We want it in a slightly stressed mode. So the technology we're using today to give our plants the right amount of water, I like to say getting the best crop per drop, is phenomenal, probably the best anywhere in the world.

Greg Dalton: Marguerite Young, is government part of the problem?

Marguerite Young: I wasn't expecting that question. I mean, as an elected official, as a part of government, I see our role as being to be the listening board of what our constituents and our customers need, and to be the delivery mechanism for having the policy discussions that we need to figure out how to deal with our water future.

I mean, East Bay MUD serves 1.5 million people, 325,000 households approximately, and we have a watershed that extends from the very top of the Sierra down to the bay, and we deal with wastewater as well so we're kind of a one-stop shop. So I think of us as being our government function is to be the stewards of a watershed resource and to use it as wisely as we can and to educate our customers about that stewardship job that we have for ourselves and for future generations.

Greg Dalton: If you're just joining us, we're talking about almonds and lawns at Climate One. I'm Greg Dalton. And my guests are Felicia Marcus, chair of the State Water Board; Paul Wenger, president of the California Farm Bureau Federation; Marguerite Young from the East Bay Municipal Water District; and Ellen Hanak, director of the Water Policy at the Public Policy Institute of California. You can join this conversation on Twitter using our handle @climateone. Ellen Hanak tell us some success stories. Who's done a really good job of being smart on water in California, being more efficient?

Ellen Hanak: So what's really interesting and kind of an untold success story of this drought is that it's not having as bad an economic impact as you might think. You heard from my fellow panelists that the population has gotten much bigger since the last severe drought, we've got more needs in agriculture with permanent crops and so on, and yet if you look at our urban areas, they're doing pretty well.

Felicia and her colleagues have been nudging them some to sort of think, really, in terms of preparing for in case this is not the end of the drought. And if the drought lasts a few more years, it's going to be worth it to them to keep some of their water in the bank and kind of be prepared for that by reducing water use now. So that's part of why everybody has been asked to reduce water use across the state. But I think that the urban agencies really learned a lot from -- we had a long drought from the late 80s to the early 90s, where a lot of folks in '91 were really scared about

serious rationing. That just was a wake-up call and it led to major investments in all kinds of things to diversify the portfolio, to create better interconnections with other agencies to reduce water use, to save more and that's really paid dividends now. So we're not out of trouble completely in the urban areas, but we're in much better shape than we would have been.

Greg Dalton: I want to go now to our Lightning Round to ask a series of yes or no questions to our panelists. Starting with Paul Wenger, is it time to revive the 1970s campaign encouraging people to shower with a friend, yes or no?

[Laughter]

Paul Wenger: You want a yes or no answer. Yes, it would depend upon the friend. [Laughter] If it's your spouse, you're safe. If it's not, you're probably in trouble.

Greg Dalton: Fair enough. Wise answer. Felicia Marcus, California water prices, overall, are too low, yes or no?

Felicia Marcus: Yes and no. It depends on where you are. Poor people tend to pay more than richer people which is unfortunate.

Greg Dalton: Ellen Hanak, water is such a small portion of household expense that people don't really respond to price changes, that the price -- raising water prices won't do much, agree or disagree?

Ellen Hanak: Disagree.

Greg Dalton: Marguerite Young, in the next ten years, some Californians will sell their house and move because of lack of water.

Marguerite Young: Disagree.

Greg Dalton: Felicia Marcus, name and shame is an effective tool for shaping how people use water.

Felicia Marcus: Not true.

Greg Dalton: Ellen Hanak --

Felicia Marcus: But competition does work.

Greg Dalton: Social peer group --

Felicia Marcus: But not name and shame isn't.

Greg Dalton: Okay.

Felicia Marcus: People want to know how they're doing compared to others. They want to be more clever than others.

Greg Dalton: Ellen Hanak, in the last ten years, Los Angeles has done more on water efficiency than San Francisco.

Ellen Hanak: Ooh, that's like so detailed. I think both done really well, I would say.

[Laughter]

Greg Dalton: I like the Giants and I like the Dodgers.

Felicia Marcus: I like the Giants and the Red Sox.

Ellen Hanak: The Giants are a better team.

Felicia Marcus: Okay.

Greg Dalton: Okay.

[Laughter]

Greg Dalton: You know where you're sitting. Okay. Marguerite Young, the agricultural industry has been slow to invest in getting more crop per drop?

Marguerite Young: It depends on where you are.

Greg Dalton: Paul Wenger, Sacramento should accelerate deployment of water meters for homes and businesses that do not have any water meter.

Paul Wenger: I think metering is coming for everybody.

Greg Dalton: Including farmers?

Paul Wenger: Yeah.

Greg Dalton: Ellen Hanak, Liberals gripe more than Conservatives about water conservation?

Ellen Hanak: Who wrote these questions?

[Laughter]

Felicia Marcus: He did.

Greg Dalton: I looked at your website this morning and you talked about how San Franciscans and there's actually some survey there.

Ellen Hanak: But that's not -- well, okay. That's a question about, do you think that your neighbors are doing enough to save water, which is actually a way of asking you whether you're doing enough. But since people don't like to say bad things about themselves, it's easier for them to say about their neighbors. So what --

[Laughter]

Greg Dalton: Especially liberals, right?

Ellen Hanak: What that means is that folks in the Bay Area are just obsessed with water conservation and it's true.

Felicia Marcus: And they're doing awesome.

Ellen Hanak: People are showering in buckets and then take -- I mean, yeah, people worry about

water.

Greg Dalton: Felicia Marcus, snow skiing is a dying sport.

Felicia Marcus: No, but --

[Laughter]

Ellen Hanak: Except last year.

Felicia Marcus: The ski resorts in the Sierra are retooling to be year-round family destinations for a good reason as they look at what will come with climate change.

Greg Dalton: So that was a no-yes answer. Okay.

Felicia Marcus: No, sorry.

Greg Dalton: Marguerite Young, California would be crazy to not consider reforming its antiquated system of water rights.

Marguerite Young: I think this is an important opportunity to really look at whether we've got a system that can get us through the next hundred years.

Greg Dalton: Last question. Paul Wenger, salmon are fish that live amazing lives, taste good and are good for you.

[Laughter]

Paul Wenger: I'd like her questions.

[Laughter]

Felicia Marcus: I bet you would.

Paul Wenger: I love to fish. I love salmon but there is a parable that if you teach a man -- if you give a man a fish, you fed him for a day. Teach a man to fish, you fed him for a lifetime. We have 39 million people in the state of California, if we all go grab a fish a day, we're out of fish. And so we need to provide for the needs, not only the 39 million people in California, 330 million people in the United States, but the 7 billion plus people in the world. In California, agriculture is a very major component for that.

Greg Dalton: That's the end of our Lighting Round. How did they all do?

Felicia Marcus: That was fun.

Greg Dalton: They did pretty well.

[Applause]

Greg Dalton: But Paul Wenger, what would you say to someone who says that agriculture uses 80% of the water in California and it's 2% of the economy? That there's a disproportionate use of vital resource for that part of the economy.

Paul Wenger: I think if you look at the farm gate value of most countries, the world of agriculture

is 2%. If you look at the tourist industry as the gross domestic product, we looked the other day, it's 2.5%. You think tourism is important; the state of California is 2.5%. As I've told people before, that's what the value is, but once it turns over, I had a reporter from Sacramento who is talking about almonds, Blue Diamond, they are about 30% of the almond industry. I said, "What do you think they pay in property taxes in Sacramento, in Salida and in Turlock? What do you think that hundreds of people have year-round jobs pay in income taxes and property taxes for their homes? What jobs would replace them?

And so we're looking at the 2% that comes off the farm, whether or not that farmer is making money, is that 2% value that is there. And as the sixth largest agriculture economy in the world, what we're doing is nothing short of phenomenal. The 80% we don't. It depends and it's a very difficult thing to monitor because of groundwater. That when we had a meeting with the governor in round numbers of the 200 million acre-feet that fall in average year in California, 200 million acre-feet of water, 200 million acres of foot deep in water, we capture between 75 million and 78 million acre-feet of that. Of that, 50% would either go to the environment for different flows, depending on the year as we discussed earlier, it depends. 40% will go to agriculture and 10% to urban.

Greg Dalton: Ellen Hanak, does agriculture do enough? Do they get favorable treatment from Sacramento?

Ellen Hanak: I think you have to remember - and I think the administration has been mindful of this - that Ag is a business and so the water used in agriculture is for productive purposes. And a lot of people kind of reacted to the governor's announcement back in April that was calling for mandatory cuts in cities and said, "This is unfair. Ag is being treated unfairly." Ag had been cut already. Ag has been cut more this year again. And in cities, the cuts that are really being talked about now are getting the outdoor water use down and that's something we can do and still have a great quality of life and it's not going to hurt the economy. In fact, it's probably really helping the landscape business at the moment.

Marguerite Young: No, no, there's support actually.

Greg Dalton: Marguerite Young, how should water rights be changed in the state? What are the questions that should be asked? That's kind of the third rail in California water politics. Australia --

Marguerite Young: I don't have a law degree, so I'm going to try to stay a bit away from that question. I think that we need to as a state, we are all - I'll grab Felicia's line here - we're all in this together and that we are looking at a hotter climate. We may be looking at a drier climate and maybe a wetter climate, but a wetter and warmer climate. Water in California is changing and we aren't prepared for it yet. And I think if we don't put everything on the table to figure out whether century, third rail, century-old water rights are somehow sacrosanct and then everything else is up for grabs, it's not going to work. We're not going to get there. So we need to figure out a collaborative process.

I mean, we've worked out at East Bay MUD something that’s been more than 20 years in the making to do a groundwater banking project with San Joaquin farmers where -- we're going to the pilot phase. If we're successful, we'll be able to store water in wet years in the groundwater basin, recharging that over drafted basin, and then having the ability to draw that water in dry years. Increasing supply reliability for everybody and reducing or eliminating our need to do any increase in our dam on the Tuolumne River or otherwise. So increasing storage without building a dam and there are plenty of innovative solutions like that to be had all over the state. And I think if we aren't talking about the "use it or lose it" doctrine or other ways to measure and value use, we're missing a huge opportunity.

Greg Dalton: Marguerite Young is a director at the East Bay Municipal Utility District. We're talking about the drought at Climate One. Felicia Marcus.

Felicia Marcus: Well, I just think there's something that I think, in some ways, headlines are divisive and don't help us figure out how to resolve these problems because there are win-wins in terms of how to steward our water molecules more intelligently. I mean, Paul talked about the need to meter. If we can meter and measure better than we do, we don't measure and have our system established as well as the other Western states, by and large. So we could tighten up the system we have. We wouldn't necessarily need to change it to tighten it up and then encourage these win-wins where people are using the same water for multiple benefits.

There are drought angels out there in agriculture who've done all kinds of things to help it. It doesn't make the headlines, but there's all kinds of innovative things we're doing to figure out how to let water flow that will help fish and then pick it up later. There are all kinds of those things happening. I think in the urban arena, the division between urban and agriculture which the 80/20, or if you do 50/40/10 which has its own issues has an issue, is misleading because agriculture grows food that people in urban areas eat.

I like to say that frequently, a person in L.A. has more of a connection on a day-to-day basis with the Central Valley farmer that grows the fruits and vegetables and nuts they eat than the jerk down the block who is overwatering their lawn, but they just don't know it. I think one of the interesting things in modern civilization is that we've done such a good job in our large urban areas, in particular, of bringing water hundreds of miles so they can take it for granted as it comes out the tap.

Many people are hundreds of miles, they don't know where their water comes from, they trust it in large part, so it becomes a very challenging thing and easy for people to pick on almonds or something else. They also don't know where their food comes from. Again, it's a miracle of modern civilization that people can take for granted that there's going to be food at the supermarket, but the fact is a farmer grew it somewhere.

And so dividing the water that way, I think doesn't help us figure out what we need to do and get to what Marguerite was saying is figure out how do we come together and find those solutions so that we can use the water we do have more efficiently for multiple purposes. And there are urban areas, in particular, all over the state that have phenomenal plans to integrate flood control, water supply, water quality, use their groundwater basins, recycle their water so that they're more self-reliant just as they have since the 70s. There's nowhere to go from up there. And then there are these partnerships between urban and ag, and between fish and farmers and groups that are actually popping up all over and we need to figure out how to encourage that.

Greg Dalton: Felicia Marcus is chair of the California State Water Board. This is Climate One. I'd like to talk about, Felicia and Paul, if a Californian is concerned about their water footprint, what food should they eat and what food should they avoid? I mean, almonds have been villainized for --

Felicia Marcus: This is quite apart from how your digestive system works.

Greg Dalton: It's always a way to be healthy.

Felicia Marcus: There are some people who don't have many choices. I do but I'm sensitive. There's people who don't.

Greg Dalton: And you like affordable protein. You eat almonds.

Felicia Marcus: I like almonds a lot. And almonds have a very low water footprint for protein, frankly, and it doesn't spoil. I mean, there are communities that have been able to get protein after disasters, whether it's Fukushima, right, or places. So just picking on a particular crop is taking a piece of things and not understanding the larger circle. My biggest eco-sin - I will admit it here, I'm sorry - In 'N Out Burgers. I'm sorry. That's my biggest eco-sin.

But I'm not saying everybody should stop eating meat, but that is a bigger footprint. But I save water everywhere I can -- and then I have that In 'N Out burger or lettuce wrap. But I mean, if everybody does as much as they can, you don't have to like -- I confessed my eco-sin, I feel better now. But everybody doesn't have to do everything; you just need to be sort of mindful. You want people to eat healthy fruits and vegetables. Walnuts are five gallons. Should people not eat walnuts? Walnuts are really good for you.

Greg Dalton: Paul Wenger, you're an almond farmer. We put a post on Facebook of almonds with little devil horns on them and they got all sorts of attraction. Why do people love to hate almonds? And tell us about the hedge funds that are going big in on almonds in the Central Valley.

Paul Wenger: Yeah, there are a lot of hedge funds probably and I've gotten in trouble by making the comment that there's probably almonds being planted where it's too high or too dry, and maybe the weather isn't conducive to having a crop every year. They're planting almonds probably where I as a grower and other growers would not do and invest in our own dollars. I would imagine there could be some people in this audience today. I know there's people in government who on one hand say, "You shouldn't be planting almonds where you're planting them," and yet they're invested in these hedge funds are doing the very thing they say we shouldn't be doing.

And so we are a free society that says you have the right to go and do capitalistic ideas, whether to start a restaurant or grow a farm. I do think that there is some tax advantages given to hedge funds that I don't have as an individual grower that allow them to do some things that I don't get to do. And --

Greg Dalton: They pay income tax of 15%, pretty sweet. Who else gets that?

Paul Wenger: Yeah, and the write-offs, I think. Talking to some accountants, they might have some benefits there that I don't necessarily get. But when you ask, what foods should we not be growing? I'm not growing almonds just to dump them out in the heat.

Felicia Marcus: Right.

Paul Wenger: The folks in this room, the folks in your listening audience, it's what they buy. It was funny. One day, I got a nasty letter from some comment I made in the media and this lady said, she said, "I just thought you were very curt in your answer."

And she goes, "I just wish I didn't have to drink this almond milk." And she said, "I just wish I could quit eating almonds, but they're very important to my diet and so I can't stop. But I wish I could stop." And so she's making the choice. She didn't like my response and my response was, "It's a free country and people can do what they can do." I'm not being curt by saying, "Hey, I'm going to take advantage of water." We've been cut back 60%.

We share a reservoir with the city of San Francisco called Don Pedro Reservoir. We were allowed 16 inches of water this year. We went through six dry years between '88 and '93, and we were never limited to that. We were limited to 24 inches and for elevated prices, you could buy extra acre-feet for your crops. This year 16 inches, you couldn't buy another inch. We're drilling our second well

today. Because if I didn't have the wells - hopefully coming online by the end of August - my crop will dry up.

And we're talking about economic harm. I don't know anybody that cutting back - and I don't want to be curt again about it - but I don't know anybody that's had to cut back watering their lawn that had to refinance their home. I know a lot of farmers that are refinancing their farms. If next year is a dry year, they will be insolvent. They will be out of business paying $2,000 an acre-foot for water, to try to get young trees through to next year, hoping that the good Lord gives them a wet year.

Felicia Marcus: And the last time I looked, nobody ate their lawns.

Paul Wenger: You could though.

Greg Dalton: Yeah.

Felicia Marcus: Technically, I suppose you could.

Greg Dalton: Marguerite Young, ten years ago, a researcher at UC Santa Cruz, Lisa Sloan, predicted the drought that we're seeing now. And she also said it could get more severe and connected it to the melting sea ice which is putting this column of warm air, sometimes it's called the ridiculously resilient ridge, that some people think it's like a brick wall directing rain away from California. What do we know about the future and the climate connection? I want to get the others too.

Marguerite Young: Well, she's definitely one of the scientists on the cutting edge of figuring out what the water future is going to mean in California, and her predictions are that we're looking at normal being 30% less than what normal is today. And if she's right, this is normal, where we're at right now. So we got to figure that out. I hope she's wrong. There's lots of modeling out there, but I think the feedback loops of the melting Arctic sea ice, increase in tundra, if we don't -- if Paris doesn't work --

Greg Dalton: The UN climate negotiations in Paris.

Marguerite Young: The UN climate later this year, if we're not getting ourselves on a two-degree trajectory, I think things are going to change pretty dramatically in California. And all I know is that it won't look like what we grew up with, it will look different than that. Our water district is right in most of the models. It's kind of in the -- could go one way, could go the other way. I mean, we've had some of the water districts in the northern Sierra still counting on decent snowpack and et cetera on a regular basis. The ones in the south, not so much and we're right in the middle so we don't know. It could go either way.

Greg Dalton: Paul Wenger, do your members make a climate connection? Obviously, it's a large trade association, but do they see a climate connection? What are they planning on?

Paul Wenger: Yeah. I mean, our membership depending upon where they're at. We got members in Santa Cruz and Napa that tend to be more of the liberal leaning side of things, and we got folks from other areas that are very conservative. And so I know one day I was interviewed by the San Francisco Chronicle, talked to the reporter for about an hour. She said, "This is a very complicated issue." And I said, "Yes." And then we exchanged emails and we talked for about another hour since and she'd been to my ranch for four hours to try to understand it.)

But after our long discussions, it said that the only comment in the San Francisco Chronicle was Paul Wenger, president of California Farm Bureau, says, "Climate change is fast upon us, we better

adapt." And I had members wanted to quit. They wanted to quit because they said, you admitted there was climate change. I said, "For crying out loud, climate has been changing ever since even before man was on the earth. We know we have a footprint; we ought to do everything we can do to reduce the footprint. But I think there, again, is a great success story for California agriculture. 95% of all the processed tomato products produced and consumed in the United States are grown in fields in California and a third of those consumed in the world

As you talked to the folks that make the tomato paste that is turned into that Chicago pizza pie, can you source your tomatoes from China or from Korea or Mexico?" And they said, "Yes, but we'd have to plant them on twice as many acres because we get more solids per the fields." So now you start thinking about carbon footprint, driving tractors through the field, the amount of shipping of the product to getting them to the processing plant, the amount of water that's used. If you want to think about climate footprint, we in California are doing it with the smallest carbon footprint of anybody else in the world.

Greg Dalton: Ellen Hanak, climate and water, do you see that, are there Californians making that connection, connecting the drought to climate?

Ellen Hanak: They are. And I think there will continue to be scientific articles and debates about whether any individual weather event, like this drought, is caused by climate change or --

Greg Dalton: Amplified by climate change.

Ellen Hanak: Yeah. What we can say for sure about this drought is that, it's hotter than any drought on record and that is very consistent with what the models are all predicting in terms of future droughts.

The future climate of California where the snowpack is not going to be the resource that it is for us now, and that's got implications for water supply, it's got implications for temperatures. And whether or not we can have enough cold water for keeping salmon going and so on. So in that sense, it's a drought that is like a drought of the future and very useful for us to help get ourselves get our act together for being able to live with this kind of drought more often.

Greg Dalton: Ellen Hanak is director of Water Policy at the Public Policy Institute of California. Our other guests are Felicia Marcus, chair of the State Water Board; Paul Wenger, head of the California Farm Bureau; and Marguerite Young from East Bay MUD. I'm Greg Dalton and you're listening to Climate One. We'll be right back after this break.

[Applause]

[CLIMATE ONE MINUTE]

Announcer: *And now, here's a Climate One Minute.*

When it comes to our water, who's really using more than they should? Jonathan Foley of the California Academy of Sciences studies food production around the world. He says it's time for Californians to stop pointing fingers and start looking for new ways to work with what we have.

Jonathan Foley: *Well, I wouldn't say anybody is wasteful. I think people are doing exactly what they were told. We've set up policies over the years that we're incentivizing certain kinds of behaviors and we're going to have to think differently in the future about water and asking what do we get for every drop? How much nutrition can we deliver to an American household or somewhere around the world for every drop of water?*

The good news is that while we've been maybe inefficient in some places around the world, there are huge opportunities to be more efficient. The typical Israeli farm is about ten times more efficient than the typical American farm in turning water into food. So that's the role of technology, that's the role of innovation, that's the role of maybe some better market signals, so that water isn't a free good, it's something of public good and has to be accounted for accordingly.

And we have to think very differently about water in California. We have water competing for food, for nature, for energy, for municipalities and we'll have to choose. How do we prioritize those things? But fortunately the envelope for innovation to push how we can get all of those things out of our water system is enormous and we're in the most innovative place in the world.

Announcer: *Jonathan Foley is Executive Director of the California Academy of Sciences. He spoke with Climate One in 2014. Now back to Greg Dalton and his guests at The Commonwealth Club.*

[END CLIMATE ONE MINUTE]

Greg Dalton: Felicia Marcus, as the top water cop in the state, what are you planning for a hot and dry 2016? What's next? What are other tools do you have?

Felicia Marcus: Well, I would say more of the above. In some ways, I think conservation is the cheapest, fastest, smartest thing we can do to extend resilience particularly of our urban areas. We're going to keep doubling down on recycling. We've put out hundreds of millions of dollars in low-cost financing. The water bond that the public in California graciously approved, gave us tools to really try and retrofit ourselves on conservation, recycling, stormwater capture, cleaning up contaminated groundwater basins.

But for safe drinking water for the communities that don't have it, but also to be able to use those groundwater basins to store recycled water and capture storm water which will help make us more resilient. So we're running on all cylinders now and we would do more of the above. We're also preparing -- part of why we're asking for more and more information and information orders so that we can better manage a very tight system which is already on the razor's edge the conflicts between fish and farmers, fishermen and farmers, but also farmers versus farmers is very heated as the water becomes tighter.

And so we're trying to double down on getting the kind of information so we can make those decisions as transparently and as faithfully to the law as we can, but it's just going to be tough. I think urban resilience is really the linchpin, I think, for a lot of it. Not just for the economy and for urban users, again, who in many cases are hundreds of miles away from their water source. So it's a challenge to get folks to realize how vulnerable they might be in an extended drought. I think as we need to be doing it anyway to prepare for climate change and we had been putting that on deck even before the drought was called.

We already at that point said, given what we know is coming in two, three, four decades where we lose our snowpack, coupled with the fact that we know we'll have population growth, we're not going to export our children. I used to say eat our young, but people thought that was too crude. [Laughter] I hung out with in college. I was probably in the --

Paul Wenger: Soylent Green.

Felicia Marcus: Yes, Soylent Green, right. That's funny [Laughter]. It was filmed in the Hyperion Treatment Plant --

Paul Wenger: That's right.

Felicia Marcus: -- under the secondary galleries.

Felicia Marcus: Sorry I'm digressing.

Greg Dalton: Ellen Hanak, Australia went through a seven-year drought, the Big Dry, what can California learn from Australia?

Ellen Hanak: Lots. I think actually we already are learning some of those things. I've heard Felicia say that one of the reasons that the board and the administration has pushed the urban conservation issue is because Australians said, "We waited too long during our drought before we really got serious about it and we regretted that." So we should prepare sooner. But I think there are other things and the issue of water rights that came up, the Australians reformed their water rights system, simplified it. There's still priorities in there, but it's simpler than ours. They've got a good information management system and that they have a much easier way of trading water during droughts and that got ag through the drought in Australia in a way that -- I mean with much drier conditions than what we have now so it helped.

Paul Wenger: I think there was a few suicides mixed in there where people had their water rights taken away and they had no way to farm. And so talking to people from Australia wasn't as easy. I guess if it's your water right that was taken and now you have no way to pay off your debt, for some people, unfortunately, they take the fast way out. But yes, there were some things down in Australia, but we're not Australia, we're California and I take exception to the fact that we should -- California the most progressive state and the most progressive nation and one of the most progressive nations in the world, we are California, we can solve this problem. We're not Australia. They don't have snow capture capabilities, even though with climate change less, but they are one of five Mediterranean climates in the world that we're one of only two. California and the middle part of Chile that has a mountain range for snow capture and rain collection and an ocean on the other side. Australia didn't have that. The Mediterranean climate doesn't, area doesn't have that and the south tip of Africa doesn't have that.

Greg Dalton: But, Paul, are you saying that in a climate-disrupted world, do you think that some people might need to give up things that they've had for a very long time, all of us, and including farmers and some of the water rights they have it quite very long?

Paul Wenger: Water rights are being given up. Our water rights in Don Pedro Reservoir go back to 1853 and I have 16 inches of water. My water rights have been restricted drastically and they have been. We also hear the term that "user pays". Don Pedro Reservoir built by the city of San Francisco in connection with the farmers from the Turlock and Modesto Irrigation Districts, there was no federal money and no state money that built that. It was the farmers and the city of San Francisco that built that. The city of San Francisco is being limited and the farmers in Turlock and Modesto are being limited because of environmental restrictions.

When you need to go get a permit, somebody says, "Oh, by the way, we want some of that water." The public didn't pay for that water, but through government, they extricated that water. That's why the bond was so important because the bond allowed $2.7 billion for a beneficial use to where the public will now pay for that component. It's for a beneficial use, whether it's for flood control, recreation, fish flows or other things. But up until now, not everything has been paid for by the government.

Ellen Hanak: Well, I might take some exception to that in the sense of as one of the ways in which California is a progressive state it's not in every factor. Certainly, we haven't implemented our system or measured it the way the other Western states have and it's more complicated, and I just

think we could make it clearer but we have --

Greg Dalton: California was the last Western state to measure groundwater extract.

Ellen Hanak: To have groundwater management, but ours is going to be better, I think, ultimately as it rolls through, but it's a great achievement and something that's on us to do thoughtfully and well. The public trust doctrine that we have where the public does own this public resource which includes our fish and wildlife. I think we've implemented it only in part since 1982 when the state Supreme Court said we could, but there's a tension because what we are doing is -- I think what Paul describes is a common feeling that folks have because they were there first, and all of a sudden we're trying to rebalance it for the common good and that doesn't always feel right. I would change the whole dialogue. Again, I'm not a Pollyanna about this, but I think the dialogue of division doesn't really help us.

What we need to do is figure out how do we have all of this, how do we figure out how to work together because people in California needed all. They need food. I think we need to be far -- we need to look at food security as as important as climate change and population growth. Because I interrupted myself, I didn't get to food security. We should have folks in urban California really valuing what we have in California as this incredible bounty that we can produce for ourselves and for the world. It's a great resource and instead it gets dismissed and figuring out how to shepherd that and help those farmers that are now farming by iPad, if they can afford it, and being very thoughtful about it and figuring out how to do win-wins with the ecosystem, and have everybody feel heard versus everybody going to their barricades.

It's how we come together as Californians which is something we can do. We are in this together, we voted for it together, and it wasn't totally all of the above. Something to do all these things we need to do versus picking one and dismissing the rest. We won't conserve our way out of it, we won't store our way out of it, we've got to do all of it.

Greg Dalton: So let's go to our audience questions. Welcome. We're talking about almonds and lawns at Climate One. Welcome.

Male Participant: Thank you. Democrat Henry Perea and James Gallagher, Surrey County representative Republican, said that conservation alone will not solve the water crisis. It is critical that we build new aboveground storage which we've not talked about. Over the last 30 years, Millerton Lake has released 15 million acre-feet of water, enough to meet the city of Fresno's water needs for 100 years. They released it to the ocean because it does not have the capacity to store it. The proposed sites in Temperance Flat Reservoir in Fresno and Madera counties would have the combined capacity to store more than three million acre-feet of water, enough to supply 6.1 million California households every year. What is the status of aboveground reservoirs since we, I think, passed a $9 billion bond?

Greg Dalton: Felicia Marcus, does California need more dams?

Felicia Marcus: Yeah. I mean, we need more storage aboveground, below ground, big and small of all kinds. That's what we put in the Water Action Plan a year and a half ago. Each given project has to move forward with its planning and with its cosponsors. As Paul said, one of the things in the bond was to pay for the public benefits, but there need to be at least half of the project has to be paid for by local sponsors and they have to make the proposal, and it's got to go through the safety and other kinds of reviews. And so I'm sure the ones that get their stuff done first have a fighting shot. Los Vaqueros was the one that got done after the CALFED process. I'm sure they're working on it now and they are doing the work on it and they'll make the proposals. They got their permits in

six months last time. So it just depends on the project proponents, getting it together and having it pass muster.

Greg Dalton: More storage on the way. Next question. Welcome.

Carter Brooks: Carter Brooks, artist and philosopher of Climate Art. The issue of freedom of choice and responding to market forces has come up a few times in this conversation, and so picking on almonds a little bit. To what extent is allowing that everybody have their free choice in this way and respond to market forces a little bit like building houses in a flood zone. When you build a tree, it needs to get water every year. Are there things that should be done about either collectively having aggregate limits or quotas, or are there other ideas around how to work with this problem of free choice market?

Greg Dalton: Ellen Hanak, limits on free market.

Ellen Hanak: I think you put your finger right on it in your question which is that farmers need to know how much water is theirs to use. And part of the challenge that we've had is that our groundwater has not had that kind of regulation and so there's been very serious overdraft and excess use in some regions, not all. And so with the new groundwater law, that's basically going to put in place a process for getting to sustainable use and then farmers should make the business decision based on market conditions of what crops to grow, rather than governors.

Paul Wenger: One real quick question I just got to add there and what she said is very right. We and with metering that's going to come, we want to make sure you know how much water you have - 30 inches a year. If we're sitting out under a shade tree, your water demand is X. If you're going to run a marathon, it's greater. Our plants, their marathon is the heat and the wind. And so if we have a cool summer and not a windy summer, we don't need as much. But what do we do, get halfway through a growing season, we have a hot windy summer and we lose our crop, but we are only limited to a certain amount of water based on historic water use. But excuse me, my plants run a marathon, they need hydration. And that's the problem when they set strict limits. It's funny when people from the environment say, "We got to have strict limits." Do you know what the environment does? The environment dictates my future.

Greg Dalton: That environment could be --

Ellen Hanak: But then shouldn't you be planting less to deal with that freeboard, right?

Greg Dalton: The future is going to be more uncertain and volatile is what climate sciences would say. The wets are going to be wetter, the dries are going to be drier. We're going to have more volatility, it's going to make it harder for farmers and regulators to do their job.

Ellen Hanak: Well we need cushions everywhere, clearly.

Greg Dalton: Let's go to our next question.

Male Participant: So you brought up the fact that we need more cushions, especially as we get more volatility with climate change. And so two of the cushions might be groundwater we talked about, aboveground storage we've talked about, but the third one which I think was brought up, in relation to the Australian experience, was water transfers and making those easier. And my understanding is that water can have a very different price depending on where you are and who you are. It could plummet to $2,000 an acre-foot for some ag. Other ag maybe paying $100. Most municipalities it's on the order of a thousand. I mean, there's a huge range. So what could we do to sort of compress that range a little bit so that everyone has a more reasonable incentive to be more

efficient and we can really use the water better and spread it around?

Greg Dalton: So Felicia Marcus, water prices depends on who you are and where you are?

Felicia Marcus: Well, I think one of the first things - and this I think is one of the great lessons that we can take from Australia - is they did spend the 90s -- it took them a decade, a lot of the things people talk about take a long time to do -- metering and measuring everything. So they actually knew what went in, what went back out, et cetera. They also had trued up their water right system. You can keep the system we have and true it up. Colorado spent 20 years adjudicating theirs. Because part of the slowdown sometimes in transfers here, right now, is just that you got to prove the water is real and that it's not paper water.

There are a million different rules. I'm not going to defend how complicated the rules are by any means, but you really could have a more vibrant market here if you had better data and then rights settled as between each other as opposed to the way we have it right now. That might be one step we could take in a decade.

Greg Dalton: Ellen Hanak.

Ellen Hanak: Just on prices. Some of the reason for prices being different is just because of the infrastructure needed in different places. And if it was an old system, it was cheaper back then in dollars back then. Do you use gravity or do you use energy to get the water to you? All of those kind of things. But the market actually will help equalize prices at the margin when folks trade. Australia has much clearer, more transparent prices than we do right now in our market.

Greg Dalton: Let's go to our next question. Welcome.

Male Participant: Thank you. Governor Brown is actively promoting the construction of two immense tunnels to convey clean Sacramento River water --

Greg Dalton: We weren't going to get through this hour without talking about those tunnels.

Male Participant: I should hope not. To divert massive amounts of water, bypassing San Francisco Bay, and down to Clifton Court. Those of us who live in San Francisco at the bottom end of the largest estuary on the West Coast of the Americas are very concerned as they learn more about this that further clean water diversions bypassing the bay will have devastating impacts on the ecology and the economies of San Francisco Bay.

Greg Dalton: And your question is about the tunnels?

Male Participant: My question is, what is the status of this project right now?

Greg Dalton: Felicia Brown.

Felicia Marcus: Most of those things are --

Greg Dalton: Felicia Marcus.

Felicia Marcus: -- that project was excluded from the bond, excluded from the sequent stuff so that's not happening. I'm not the best person to talk about it because it's a project that's going to come to us for a permit. But there's one misnomer in that that I think is important to clarify for people. One issue is the plumbing, right? Because right now water is taken from these giant pumps at the bottom of the Delta that mess up the salmons, reverse flow, can draw smelt in. I mean, those

pumps are probably the last place you would put them if you're going to start again. And then the project is about looking at an additional place of diversion further up near the Sacramento River which has more water, where you could take from that when it was bad for the species down at the bottom, and you can take from down there when the species were up there.

There are concerns about having flow that stays in the Delta, but the issue of how much water in total might not necessarily be different, and that decision is something that sits with the state water board as we do our Bay Delta Water Quality Standard.

Greg Dalton: There we go. We have to end it there. Our thanks to Felicia Marcus, chair of the California State Water Board; Ellen Hanak, director of Water Policy at the Public Policy Institute of California; Paul Wenger, president of the California Farm Bureau Federation; and Marguerite Young is a board member at East Bay Municipal Utility District. You can join the conversation on Twitter using our handle @climateone. I'm Greg Dalton. Thanks for coming here at the Commonwealth Club and thanks for listening online and on air.

[Applause]

[END]