

**Western Governors' Association
Plenary II – Managing Water in the West
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Transcript of Brad Udall, Director of the Western Water Assessment

And it's critical, adaptation is critical because there's an addition 1°F warming embedded in our system right now, regardless of what we do. If we totally stopped admitting green house gases, we would see about the same amount of warming we saw in the 20th century. We are now well into the era where water is a zero sum gain in large parts of the West and climate change offers the possibility of a declining sum gain. Water diversions in United States peaked in 1980, most people don't know this. And they peaked, not because we wanted to stop diverting water, they stopped because it was uneconomic to do so, because there wasn't more water to divert or in many cases we had environmental legislation that precluded diversion. Now, these fundamentals facts haven't changed and I'm gonna bet that all of you, in your states and your providences, have your own zero sum gain, be it Governor Richardson, the Silvery Minnow in New Mexico, or Governor Schwarzenegger's enormous issues in the Delta in California, or the Klamath in Oregon. You know, right now there's a compact that the Great Lakes states want to sign that would preclude water diversions in American Southwest, that's how serious this zero sum gain is and how much it permeates our thinking on this. I think it's very clear to all of us that the 21st century is going to be a different one, on both the water and energy fronts and climate is a key component to both of these.

The driest states in the Nation are right here in the West. Your state, governor, is one of them, Las Vegas, Southern California and we are already seeing the impacts of climate change in the West. Be it the Pine Bark Beetles in Arizona and in British Columbia that are part natural cycle but part warmer temperatures that allow the beetles to allow them to get two life cycles in per year now. The reduction in snow pack that we're seeing in the Northwest mountains and in the lower mountains in California, perhaps less so in the higher mountains. Advances in spring snow melt run off timing. The increased incidents in fires we've seen since 1985, the incredible warm temperatures in the Southwest and increased incidents of drought. And I believe that old supply sides solutions like more reservoirs will play a role in this but the hunt really is on for new ones which are going to allow for the growth of the West, we're gonna get whether or not we like it or not, and these new solutions need to figure out ways to keep the agricultural healthy, promote our new growing recreational economy and in general support this allusive concept of sustainability.

In 1982 British Airways Flight 9 took off from London to Singapore and over Indonesia ran into this volcanic cloud of dust with the result that all four engines on this aircraft shut down. And after four minutes the captain came on and this is what he said verbatim, he said, "Ladies and gentlemen, this is the captain speaking. We have a small problem. All four engines have stopped; we are doing our damndest to get them restarted. We hope this does not cause you too much distress." Now, I tell this story because when you get on an aircraft and when you do many things in your life, you base it on the idea that

the past will continue into the future, right? Well we now know, and water planning is this idea, it's everything about water planning from flood control road curves, the yields, even curbs and gutters are based on this idea of fixed climate. We now know and have known for some time that climate change will fundamentally alter the water cycle and it makes all of these old engineering factors and ideas about planning, it makes them irrelevant or more irrelevant the further on we go. This has given water managers of the West some consternation, perhaps not as much as those poor passengers on that plane which did in fact land successfully in Jakarta and flew later after they replaced all four engines on it.

You know the impacts of climate change in water; let me talk briefly about them. Higher temperatures mean a bigger atmospheric sponge, it means more evaporation and it also means heavier down pours. When you ring that sponge, more is gonna come out. We're actually going to see more precipitation on a global basis but not necessarily regionally. We're going to have regional winners and losers and the American Southwest, to the best we now know will in fact be one of those losers. We expect heavier down pours, longer periods between precipitation less light precip. We expect more droughts and more floods, sometimes in the same places. More rain and less snow although in the West there is going to be a lot of nuances that we're going to have to figure out like this winter which was quiet unusual in large parts of the West. More variability, earlier run off, lower flows in our rivers in late summer. We're gonna sea level rise. It will threaten places on our coast.

What are the ramifications for the West? There's a relatively strong consensus as I previously mentioned. The Southwest is likely to see reduced run off due to these increased temperatures. California, Oregon and Washington and other places are going to see bigger floods, potentially much bigger. A 100 year flood that we previously, a thirty year flood, let me rephrase that. We may see 100 year floods that have 30 year return intervals or even 20 or 10 year depending how much warmer it gets. The interior states, the American West are likely to see more frequent and longer lasting droughts and we're likely to see changes in ground water recharge that we don't fully understand at this point. And I mention that because many states are very dependent on ground water for municipal and rural water use.

Let me talk a little bit about the water energy so called water energy nexus. Water is heavy. It is 8 lbs a gallon. And there is no water without energy which is to say that our water delivery systems taken in enormous amount of energy to delivery water. They have to pressurize it, they have to treat it to drink, they have to treat it on the other end, you heat it. And we have no energy without water. Most of the plants that we have are thermo power plants and they need water for cooling. Hydro electric power obviously needs water directly. There's this incredible linkage between these two. Many of our major utilities in the West like the Central Arizona Project use enormous amounts of electricity. Central Arizona Project uses 400 megawatts every minute every second of the day. That's enough for 400k homes of average load or 40k peak loads because in part, their pumping water 300 miles and 3,000 vertical feet to get it down to Tucson. In California the numbers are even more shocking. The State Water Project uses 2% of all

energy and 20% of all electricity in that state is utilized for water related purposes as is 30% of all non-power plant natural gas. Saving water saves energy. So if you save water, you save energy at every step of that delivery system from heating it to treating it to drinking it and treating it on the waste water side.

New water projects that get proposed need be scrutinized based on their energy profiles. How much energy and what kind of energy. Perth Australia just recently installed an entirely new desalinization plant. Originally it used to be powered with coal and it turned out they powered it with wind. And let me say the flip side is true, new energy projects also need to be evaluated based on their water profiles. So things like oil-shale and bio-fuels, we need to take a very close look at this. And I will note that both wind and portable tanks use almost no water. They use some water in their production but not in their day to day use. And my recommendation for WGA is, you all need to be engaged in this water energy nexus. It's a fascinating connection and its one of the few times when we deal with climate change that you get to deal with both sides. The mitigation, the reduction of green house gases and the adaptation side, how do you get use to dealing with this new world we live in? They don't often exist and this is a very powerful one.

I have three things to talk about on climate change, adaptation strategies and process. First let me mention that Las Vegas is probably the most threatened city in the Nation with regard to climate change in water, 90% of its water comes out of Lake Meade. I don't know how many of you know Pat Mulroy who's the dynamic head of the local water Authority there. Earlier in this year in the Denver Post she was quoted as saying that she hoped the next president would create a team of federal agencies attached to water resources to develop a survival plan for the driest and fastest growing region in the United States. She further went on to say the rapid decline of Lake Meade begs the question for a comprehensive look at climate change. Our world is going to change dramatically. I don't know if Pat knew it or not but she was really talking about a national climate service when she talked about team of entities. And there are now two bills out there in Congress. John Kerry and Olympia Snow have one, and that chump from Colorado Mark Udall has another one that deal with what a national climate service might look like.

I just attended a week long conference in Vail and a national climate service, the idea is to get the information in the hands of the people that really need it with regard to data, with regard to modeling, with regard to research and education in outreach. And what we have right now is a grab bag amongst these federal agencies and Western Governors could do a really good service here by potentially serving as an convener of these agencies to discuss what a national climate service would look like and to facilitate some other important aspects of this.

I want to talk briefly about data and climate in the West because it is so critical. I get to attend a large number of conferences, scientific conferences and as you might imagine these scientists love to argue on results. And frequently, the first thing they talk about in a very highly nuanced and technical way. It starts like this, your data suck. We have not done a good job with our data with regard to snow, with regard to other forms of

precipitation, with regard to temperature. It is not of the quality we need for effective management and it's not of the quality we need for good scientific studies.

Let me also mention with regard to a climate service. We need better climate models and there are people here from the National Center for Atmospheric Research which is one of the three main modeling centers in the US. The current generation of climate models operate at scales that are far too big for local decision making and we have got to invest additional dollars in this.

Alright, my second adaptation idea here is if we want to protect the values of the West that we all love, we have got to get serious about water conversation. We've talked about this since, even since 1973, one of the first national reports by the National Water Commission. We can do this without impacting lifestyles, water is too cheap. The average price in municipalities is 2 bucks per 1000 gallons and I would ask all of you to name another item that you get delivered to your door, 8,000 lbs every month for 2 bucks. It doesn't exist. Under pricing leads to over consumption and more importantly, under investment and we now have many cities in the West that have begun to experiment with these increasing block rates, the more you use, the more you pay. And even in the case of Boulder Colorado and I think elsewhere, these individualized water budgets per house based on acreage or square footage of lawns and number of people, we can do a better job and we have. The recent drought Denver water reduced water use by 20% with very little effect. And Seattle has had absolutely flat demand for many years based on very promising rebates and other factors. Assembly Bill 2175 in California now mandates 20% conservation by 2020. Sounds like your Green House Gas Mitigation Bill doesn't it? Maybe we need to incorporate that idea. My recommendation is that Western Governors work with the Western State Water Council and others to help utilities overcome their understandable but not very useful resistance to promoting efficiency. They spend about 2% in a front range in Colorado on efficiency measures and we can do better than that.

Alright my third adaptation idea here is in terms of new supplies. There are reports in the West that give us the idea that somehow we're gonna come up with all these new supplies. We're gonna tow icebergs, we're gonna import Mississippi water. We're gonna do all kinds of things that just seem terribly, terribly unlikely. There is one new source though I'll tell you that I get very excited about and it's called re-use. We've done it for some period of time and you can do both portable and non-portable re-use. Some opponents of this portable re-use have called it 'toilet to tap', not so yummy name, ah. But believe it or not we have the technology to totally clean up water and if portable re-use gives you the willies perhaps these pharmaceuticals that are being measured in parts by billion and in our waters for example, in Boulder Creek and in the Potomac and Lake Meade, they're actually changing the gender of fish. This technology removes those pharmaceuticals, it removes contaminates at part per billion and in Orange County they actually add minerals and other things back into the water, it's so pure.

This source of water, its drought proof, it's available to almost every community and it something we need to pursue vigorously and I would encourage WGA to be involved with that.

Let me end and talk about this remarkable planet that we live on. It's the water planet; water vapor actually is part of the green house effect. It's the most important part of the green house affect. There is some evidence that comets delivered the water that we have on this planet and they continue to deliver water to this day. There is an enormous number of interesting facts about this planet, plate tectonics actually keep CO2 levels on very long term scales within a reasonable level keeping temperatures stable. This large moon we have which is really unusual for a planet our size stabilizes our tilt which is really important to our seasons. Jupiter and Saturn actually act as comet sucks because of their gravitational fields and protect from asteroids and comets. This plants just the right distance from the sun and our own solar system. We happen to be just in the right place in this galaxy. It is truly a beautiful planet and I am encouraged based on my work with water utilities around the West including the New Water Utility Climate Alliance which is 8 of the biggest utilities in the country that these utilities, they see the threat that climate change has on water resources and they are working to alleviate it as you all are and you will continue to do I think with the adoption of your report today.

So I thank you very much for the opportunity to address with you and look forward to engaging you in some Q&A.

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