

**U.S. Senate Committee on Energy and Natural Resources
October 8, 2015 Hearing: Drought Legislation
Dan Keppen Responses to Questions for the Record**

Questions from Chairman Lisa Murkowski

Question 1: In your testimony, you reference your report, *Innovations in Agriculture Stewardship: Stories of Conservation and Drought Resilience in the Arid West.* Could you briefly describe how it came about, describe one of the case studies and the results?

Response: “*Innovations in Agricultural Stewardship: Stories of Conservation & Drought Resilience in the Arid West,*” focuses on five case studies that profile producers across the Colorado River Basin and beyond who -- with curiosity, creativity and seasons of trial and error -- are conserving resources while enhancing productivity. The Alliance teamed up with the National Young Farmers Coalition (NYFC) on this report with the aim of elevating the voices of farmers and ranchers who are employing smart solutions to build drought resilience, steward water and grow good food. This effort – and an October 2014 tour of several of the ranches highlighted in our report – was funded with assistance from the Walton Family Foundation.

One of the case studies features Wyoming ranchers Pat and Sharon O'Toole, who have always managed their land with conservation in mind. Along the way, they've built strong partnerships with Trout Unlimited, Audubon Wyoming and The Nature Conservancy; organizations some ranchers once viewed as adversaries. The O'Tooles' Ladder Ranch, like many ranches in the interior West, relies on irrigation water derived from melting mountain snowpack. That water feeds a myriad of purposes. It grows hay and grass pasture, which supports the financial bottom line. It buffers soil against drought and fills creeks and streams. It supports trout fisheries and the anglers who seek them. It enhances biodiversity and provides water to wildlife that use Ladder Ranch as a migratory corridor. It draws in beneficial insects and pollinators and helps build a beautiful landscape. The O'Toole's holistic approach manages for all of these values simultaneously. Importantly, upper watershed surface water storage projects – developed locally and in collaboration with government agencies and conservation groups – play a critical role in providing multiple benefits to Ladder Ranch and the environment it supports.

As the pressures of climate variability and drought increase, farmers and ranchers are at the forefront of our national adaptation strategy. Producers are coming together to help one another, but they also need support from consumers, policy makers, scientists, and service providers. We hope that these case studies will provide policy makers and other stakeholders with a more nuanced understanding of the diversity and complexity of western agricultural water conservation and an appreciation of what continuing to take agricultural lands out of production might mean.

Question 2: What should be our key takeaway from your report?

Response: Water resources challenges are unique and require unique, locally-driven solutions. Some of the farmers highlighted in the Alliance report are integrating efficient irrigation technology with soil health to increase both productivity and water savings. Others are

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navigating conservation within constraints outside of their control, such as the operations of the ditches which deliver water to farms. To paint a fuller picture of the complexities and nuances of agricultural water conservation in the West, the Alliance and NYFC worked with the engineering firm Applegate Group to create a water balance for three of the case studies. These water balances utilize a technical, objective approach to assess the producers' water rights, current conservation efforts, and barriers or opportunities for future conservation. They underscore the reality that conservation practices are different on every operation and unique from farm to farm.

Question 3: In your testimony you say “federal agencies managing the competing demands for water in the West have in some cases failed to examine or pursue opportunities for more flexible water management that serves both economic and environmental goals”. Can you give an example?

Response: I can provide four specific examples:

Example 1: Sacramento-San Joaquin River Delta - Despite record-breaking dry conditions in California in 2014, and the Governor's declaration of a state-wide drought emergency, the Bureau of Reclamation, the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service erred on the side of fish protected under the Endangered Species Act (ESA), failing to use common-sense discretion that would have provided increased operational flexibility for the Central Valley Project (CVP) and the State Water Project while still protecting listed species. When local water agencies pressed the federal agencies to use discretion, based on emergency conditions, they were told that it would likely result in the imposition of harsh “mitigation” measures. Specific examples include management decisions made relative to the cold-water pool temperature plan and the Coordinated Operations Agreement, and Temporary Urgency Change Petition orders issued by the State Water Resources Control Board. The Trinity River Division flow augmentation releases provide another example that is further detailed, below.

Any federal agency decision which may, now or in the future, have any implication or impact on a listed species must find agreement from those in government who are charged with implementing the ESA. The Act that guides them requires no balancing of interests, no concern for our food supply or food safety, and no consideration of the human impacts of their regulatory decisions. The agencies' powers are near boundless and the judicial system gives their decisions great deference.

There is considerable discretion in how the ESA can be implemented. Given the significant scientific uncertainty that exists with many of these species and the ecosystems in which they reside, and the failure of the ESA regulators to look at the broader set of stressors affecting them, the Alliance believes these agencies must step back and rethink the consequences of their actions. Even though the ESA does not require the human consequences of their decisions to be considered, it does not prohibit such consideration. Understanding the impacts on people that

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come with ESA decisions is simply good public policy. To ignore how people are affected is simply bad public policy and an overreach of federal regulatory power.

Example 2: FERC Drought Emergency Authority - During drought emergencies the Federal Energy Regulatory Commission (FERC) has the authority to adjust licensing conditions for hydropower projects that affect water storage and fishery requirement. FERC has been proactive in exercising that authority, but in some instances state and federal fishery agencies, which set the flows and fishery conditions on hydropower licenses, are reluctant or slow to cooperate, or they impose out-scaled demands for ‘mitigation’ of emergency actions. For example, a February 6, 2014 letter was sent from FERC to all hydropower license holders in California saying “staff of the Federal Energy Regulatory Commission is prepared to act swiftly to review requests to amend licenses on a temporary or longer-term basis, as appropriate, in order to conserve water resources at FERC-licensed hydroelectric projects.” Since sending out its letter, FERC has received and acted upon several requests to adjust hydropower license conditions because of the drought. Fishery agencies, and California’s State Water Resources Control Board, have in many cases cooperated promptly on such requests. In others, final decisions are pending or are being contested by environmental organizations.

Example 3: Trinity River Management - Throughout this severe drought, Reclamation has chosen to release over 120,000 acre-feet of stored water from Trinity Reservoir at the expense of the Central Valley Project, including its water users across California and endangered species in the Central Valley. While the specific justification for these “emergency” releases varies from year to year, the general intent is to prevent disease outbreak in migrating Chinook salmon, a fish species that is not protected by the ESA. After a decade of providing flow augmentation on the Lower Klamath River, we are unaware of any sound scientific evidence clearly showing that flow augmentation has prevented a disease outbreak. All of the decisions made to date appear to have been policy- (not science-) based, driven by fear and political pressure. Unfortunately, California and Oregon water and power customers have suffered enormous, quantifiable, and unmitigated losses (see response to Question 8, below).

Example 4: Outdated Reservoir Operating Criteria - The Corps of Engineers operates dozens of water projects throughout the West, and it regulates the operations of many non-federal dam and reservoir projects according to criteria that in many cases were established decades ago and have not been updated to reflect changed conditions or new technology. As a result, projects are sometimes forced to waste large amounts of water in order to adhere to the letter of a flood-control plan that no longer has a basis in reality. The Corps has existing authority to make short-term adjustments to operation criteria during droughts, but the agency rarely does so on a proactive basis.

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Question 4: What do you believe will be the most effective provisions of H.R. 2898 in maximizing water delivery?

Response: Relative to California Bay-Delta operations, H.R. 2898 directs the agencies to operate the state and federal water projects at the upper limits allowable within the biological opinions. The bill also contains provisions that require the agencies to move and capture water in early storm events if there is no harm caused to protected species. H.R. 2898 further requires the agencies to quickly issue transfer permits. All of these provisions are permanent, and will effectively maximize water delivery.

In addition to its California Delta-focused provisions, H.R. 2898 would enhance future water supplies throughout the West by streamlining permit decisions and authorizing expedited procedures to make final decisions on operations and water projects that can maximize water supplies. It also provides the Secretaries with new authority to approve projects that normally would require congressional authorization.

Question 5: In your testimony you suggest that we must invest in the Western Water infrastructure necessary to meet current and future needs and that our existing is aging and in need of repair. Given the limits of the federal budget, what is the most effective way the government can be a partner in that investment?

Response: More surface and groundwater storage is still a critical piece of the solution to water shortfalls. Congress should streamline regulatory hurdles to assist in developing new environmentally sensitive water storage projects and other necessary water infrastructure improvements. Congress should work to facilitate the construction of new surface storage facilities, providing a more effective process to move water storage projects forward.

Also, new tools to assist in financing major improvements to aging water infrastructure will be needed in the coming years to ensure that farmers and ranchers charged for these upgrades can afford repayment. Water infrastructure is a long-term investment, as are farms and ranches, and long repayment and low interest terms will be crucial in reinvesting in new and aging facilities to meet the challenges of tomorrow. Such improvements could include investments in everything from new water storage reservoirs (both on- and off-stream), regulating reservoirs, canal lining, computerized water management and delivery systems, real-time monitoring of ecosystem functions and river flows for both fish and people, and watershed-based integrated regional water management. With the advent of the Water Infrastructure Finance and Innovation Act (WIFIA) in the WRRDA 2014, the Alliance believes a similar affordable loan program could be instituted at Reclamation to assist in providing capital for such investments. Also, more flexibility may be needed to allow for private non-federal investments at Reclamation facilities in order to attract additional capital to meet future water supply needs.

Western irrigators need flexible, streamlined policies and new affordable financing tools that provide balance and certainty to support collaborative efforts and manage future water

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infrastructure challenges. Solutions in all of these areas will be crucial to future enhanced agricultural production, conservation and community outcomes in the West.

Question 6: Can you summarize the key points of your recent article “*The 2014 drought and water management policy impacts on California’s Central Valley food production*”?

Response: The Journal of Environmental Studies and Sciences recently published this peer-reviewed article, which I respectfully request be included in the hearing record. During 2014 and 2015, California experienced one of the worst droughts in 160 years of record keeping. The Bureau of Reclamation announced zero water allocation for Central Valley Project agricultural water service contractors—with a devastating impact on food producers.

The article explains why farmers perceive the collapse of their water allocation as, in part, a “regulatory drought” brought on by political decisions about who should have the water. The growing demands of other sectors have been met at the expense of agriculture. Uncertainties in the current political process not only undermine the reliability of the agricultural water supply but also diminish the industry’s ability to make long-term adaptive decisions. The implementation of environmental laws and policies has been particularly distressing to farmers because of the large quantity of water designated for environmental use and the apparent weakness of scientific evidence to justify it. The realization of supposed benefits, such as restoration of endangered fish populations, has not been convincing. Moreover, information is lacking on alternative management options that might be more effective. Our published journal article presents two recommendations as a means to increase the resilience and reliability of the water supply for all user groups: (1) a mediated settlement generated by all stakeholders involved in water use sectors that bear upon the comprehensive and long-term management of the San Francisco Bay-Delta and threatened and endangered species that depend upon it and (2) an increase in water storage infrastructure to buffer future fluctuations in snowpack runoff.

Question 7: In your testimony, you stated that the role of the Federal Government should be from the “ground up” rather than a “top down” approach. Can you specify, in your opinion, what “ground up” approaches might the federal government play a role in advancing?

Response: The Family Farm Alliance has long advocated that the best decisions on water issues are made at the local level. Here are some specific approaches the federal government can play a role in advancing this philosophy:

Solutions to conflicts over the allocation and use of water resources must begin with a recognition of the traditional deference to state water allocation systems. Federal agencies must acknowledge that they are required to adjudicate water rights for federal purposes according to state law and abide by state decrees defining both federal and non-federal rights.

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The federal government needs to seriously consider adopting a policy of supporting new projects to enhance water supplies while encouraging state and local interests to take the lead in the planning and implementation of those projects. Local and state interests (such as the Sites Joint Powers Agreement in Northern California) have shown enormous creativity in designing innovative water development projects. Water agencies have at times obtained additional federal funding through the appropriations process; however, Reclamation could also supplement this effort by supporting local partnership agreements, especially where Reclamation and its water contractors are identified as potential beneficiaries.

The federal government should continue to support WaterSMART and/or other programs that provide incentive-driven cost share money for new, locally-driven water conservation projects. Small federal investments in cost-shared, competitive grants help irrigation districts make larger investments in water conservation and management technologies that can help stretch water supplies to meet unmet needs. The Secure Water Act should be reauthorized to extend these grant programs into the future.

The Endangered Species Act (ESA) can play an important role in species protection, but it can only successfully do so with increased public input, stakeholder cooperation and new “outside-the-box” thinking on transparency and accountability. Unfortunately, the manner in which the ESA is being implemented in its current form discourages this sort of an approach. But, there are encouraging templates for success that should be recognized. For example, one of the first applications of ESA section 10(j) in the United States by the National Marine Fisheries Service (NMFS) occurred in the Deschutes River Basin. This occurred because of the proactive water conservation and fisheries restoration work completed to date by local irrigation districts in partnership with cities, counties and other stakeholders in Central Oregon. These water users have received assurances from NMFS that their lawful use of water supplies will not be at risk due to the implementation of the ESA while this Sec. 10(j) designation is in effect. Many water users in other parts of the West have done much to conserve water, restore ecosystems, and take other actions to steward the environment, and have yet to receive the sort of regulatory “assurances” that the Deschutes Basin districts have. The relationship that exists between the local water users and federal regulatory agencies in the Deschutes Basin should serve as a model for other regions of the West. This remarkable success story also demonstrates that private landowners should be viewed as potential partners in species recovery, not adversaries.

If federal agencies are willing to take lessons from how farmers and ranchers are coping with the drought, the result would likely be better management of water for both economic purposes and environmental uses. The written testimony provided by Cannon Michael on behalf of the Alliance at your June 2015 ENR Committee drought hearing provides several other real-world examples that further demonstrate what we mean when we advocate for “ground up” solutions to address the current drought and water management for the future.

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Question 8: You mentioned how policies of strict or rigid regulatory standards have negatively impacted farmers. Can you expand on some of these impacts in terms of direct economic loss or damages?

Response: Western farmers and ranchers have witnessed first-hand the on-the-ground impacts associated with agency implementation of federal laws on farmers and their families. I'll provide below three examples to address your question.

Klamath River Basin (CALIFORNIA / OREGON) 2001. The Klamath River watershed covers a nearly 16,000 square-mile region comprising parts of southern Oregon and northern California. The Klamath Irrigation Project, under the oversight of the U.S. Bureau of Reclamation (Reclamation), provides water to about 240,000 acres of irrigable crop lands. In 2001, the federal government announced that, for the first time in 95 years, no water would be provided for Klamath Project irrigators from Upper Klamath Lake or the Klamath River. Instead, that water was wholly reallocated to meet the alleged needs of three fish species protected by the ESA.

Rural farmers and ranchers in Klamath Basin communities owe their very existence to the certainty of the water supply developed over 100 years ago for the purposes of irrigation. Those families were subjected to unbelievable levels of stress and anxiety in 2001 and during the troubling years that followed, experiencing a drain on their finances, a toll on their health and strained family relationships. These farmers were impacted in a multitude of almost unimaginable ways when their water supplies were curtailed in 2001.

The types of economic, human, and environmental suffering caused by the 2001 Klamath Project Operations Plan were catastrophic and well-documented. Hundreds of farm and ranch families, suddenly finding themselves without a farming income, experienced the hardship of trying to support themselves and their families. Their ability to pay bills and service debt was severely impaired. Contracts for their crops from regional and national food processors were cancelled, some never to be renewed. Similar types of impacts were felt by farm employees, and the owners and employees of the agriculture-related businesses in the community. The demand for social services increased. Some people simply moved out of the area. City parks, schoolyards, and cemeteries withered without water. Farm fields became fields of weeds and dust. Unrelenting wind-borne soil erosion occurred, impairing land productivity and causing air pollution.

Irrigated farmland provides tremendous food and habitat for the abundant waterfowl, deer, antelope, frogs and other species. That value was also lost. Tragically, two of the nation's premier national wildlife refuges were left without water for wetlands, food production and waterfowl habitat.

The Klamath Basin water crisis adversely impacted the financial position of the farmers of the basin. This was due to loss of income, loss of opportunity to grow crops in 2001 (a year of relatively high commodity prices), capital expenditures for wells and other adjustments to

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irrigation systems, producers being forced to farm further from home, cash contributions to fight the water battle, and fewer buyers of commodities (i.e. some potato sheds shutting down after 2001). Farmers also experienced income tax impacts, an inability to establish credit, and were wracked by uncertainty about the future of their farms and their lives.

Central Valley (CALIFORNIA) 2009, 2014-2015. Similar impacts were felt on an even greater magnitude by irrigators and communities in the San Joaquin Valley in 2009 and 2014, and will be felt again this year throughout the Central Valley. Sacramento Valley CVP Ag Water Service Contractors within the Tehama-Colusa Canal Authority were hit hard, as well. I refer you to the Journal article discussed in the response to Question #6 above for more detail on how farmers, rural communities, the environment and the economy have been impacted by agency decisions associated with managing federally-protected fish in California's Bay-Delta.

In both the Klamath and San Joaquin Valley instances, tremendous impacts were felt by landowners, water users, their local communities, other species and the environment, while benefits to the "listed" species of concern were questionable at best, or even unknown.

Trinity River / Central Valley Project (CALIFORNIA) – The Bureau of Reclamation's recent management of Trinity River (CALIFORNIA) flows, which has been intended to protect non-listed Chinook salmon runs on the Lower Klamath River, which is fed by the Trinity River as a tributary to the Lower Klamath River, has generated tremendous concern with Central Valley Project water and power customers. Originally, Trinity Reservoir, located upstream on the Trinity River, was built as a storage reservoir for the Central Valley Project (CVP), with stored water delivered to the CVP through a trans-basin diversion. Throughout this severe drought, Reclamation has chosen to release over 120,000 acre-feet of stored water from Trinity Reservoir to the river at the expense of the CVP, including its water users across California and endangered species in the Central Valley. While there is no known measureable benefit of those releases to salmon in the Lower Klamath River, other listed species may have also been harmed, such as winter-run salmon on the Sacramento River (where the CVP Trinity water would have flowed). Other affected species include listed Coho salmon, Giant Garter Snake, and San Joaquin Kit Fox, migratory waterfowl and the once imperiled American Bald Eagle.

To CVP agricultural contractors, the loss of 123,000 acre-feet in today's drought-driven water market equates to nearly a \$250,000,000 replacement value. This does not account for the other known socio-economic impacts resulting from fallowed farm acreage, lost crop production, lost sales, lost employment, and increased need for social services throughout Sacramento and San Joaquin Valley communities, many of which are disadvantaged, poor communities.

Question 9: Could you expand on losses experienced by stakeholders as a consequence of these drought years? Are they quantifiable at this time?

Response: The Family Farm Alliance represents farmers and ranchers and that is the sector we

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best understand. Some preliminary estimates of drought-induced losses have been developed by academia in California and Washington State, but truly meaningful assessments likely cannot be generated until harvest operations wrap up in the coming weeks.

However, it is clear that farming, and farmers and ranchers in California and elsewhere in the West have been hit hard by the drought. I refer you to the written testimony of Cannon Michael, who represented the Alliance at your June 2, 2015 drought oversight hearing, for an overview of Western drought conditions and related impacts that were occurring at that time. For example, the Washington Department of Agriculture at that time projected a \$1.2 billion crop loss this year as a result of the drought. In the Walla Walla and Yakima River regions, water was shifted from creek to creek, sometimes through existing irrigation canals, to keep water flowing for steelhead, Chinook and bull trout. Fish were even hauled farther upstream to cooler water.

California was hit especially hard, for the second year in a row. In most areas where surface water supplies have been severely reduced or eliminated, California farmers turned to groundwater to maintain their permanent crops – grapes, tree fruits, nuts, and citrus – that represent a lifetimes’ investment. But groundwater supplies are not infinite and were severely depleted in 2014 in areas that received no surface water. Groundwater also is not cheap. Wells cost upwards of \$200,000 each and they are expensive to run, so many farmers pump only enough water to keep their trees alive, without producing a harvestable crop. Often, farmers tear out mature, productive trees and vines and replace them with saplings that won’t produce a crop for years, but require far less water to keep alive now. And in some places, mainly the citrus belt in the Friant Division of the CVP, there is no groundwater at all. The many small farms there, which produce most of the nation’s navel oranges, had their surface water cut off for the first time in 60 years last year. Most of those farms received no surface supplies again this year, and as a result, decades-old orchards were bulldozed out of existence.

This year, many Central Valley farmers also fallowed large tracts of land that are normally highly productive. When one hears that land is “fallowed” it might only seem that the impact is to the farmer, but that is definitely not the case. Every acre of farmed land generates jobs, economic activity and products in mostly rural farming communities. That is why the drought is so devastating to the rural agricultural communities of the Central Valley. There is a huge interconnection between agriculture and many other industries. Some press reports earlier this year acknowledged that California agriculture is a \$46 billion-dollar industry, but then tried to minimize this impact by suggesting that it is “only” 2% of the GDP of the state. The oft-reported \$46 billion number is only the “farm-gate” value of the crops produced. It does not include all the other industries that benefit from the trucking, processing and sale of the agricultural products (and all the fuel, parts, etc., from the farming, packaging and processing activities). A recent report by the University of California shows that the food and beverage industry contributed \$82 billion and 760,000 jobs that are directly and indirectly linked to agricultural

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products grown in the State of California.¹

With that said, we know that the impacts to our industry and to our communities are only part of the picture. Water shortages affect all sectors of the Western economy, creating problems for cities and towns, manufacturers, builders, service providers, and individual citizens that are just as challenging as the difficulties faced by farmers and ranchers. The environment, too, is stressed by drought. In many areas of the West, species both plentiful and endangered are struggling to adapt and survive in extremely harsh conditions. This past year has brought wildfires, shortages of electric power and drinking water, business failures, unemployment, and other drought-related consequences, including harm to fish and wildlife, that will linger far into the future.

Question 10: With regard to fallowing programs, given that any provisions on water rights have an associated economic impact, what should the role of the federal government be in minimizing these impacts?

Response: Transfers involving land fallowing must be carried out consistent with state water laws and regulations, and always have to meet the test of not damaging other state-based water rights. Such analysis should include any ancillary economic and social damages caused to agricultural communities dependent on crop production. Agricultural land provides many environmental benefits, regardless of how the water is used or what crops are grown. Federal agencies need to also recognize and take into account these environmental attributes whenever federal funds are used to support fallowing proposals. Competing environmental demands for water must be a part of the discussion just as competing agricultural demands are today.

There are other potential costs of water transfers for decision makers to consider when taking into account broader economic implications from Western irrigated agriculture. These could be termed externality benefits or, if foregone, the “silent opportunity costs” inherent to changes to Western irrigated agriculture indirectly tied to the consumer spending economy. Americans currently enjoy the benefit of the lowest percentage of disposable income spent on food in the world, which helps drive our consumer economy. And this fact is driven in no small part by the long history of food and fiber production from Western irrigated farms and ranches.

Interestingly, the Center for Irrigation Technology (CIT) at Fresno State released a report, “Agricultural Water Use in California: A 2011 Update”², which concluded that the only large potential for moving water from agriculture to other uses will come from fallowing large swaths of farmland. While there may be some financial benefits gained using this “buy and dry” approach, there is another price that will be paid, and that relates to the importance

¹ http://giannini.ucop.edu/media/are-update/files/articles/V18N4_3.pdf

² The full report is available at <http://www.californiawater.org>.

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of maintaining America's access to low-cost, safe, high-quality food and fiber, made available in large part by Western irrigated agriculture.

Questions from Senator Mazie Hirono

Question 1: I am happy to see provisions in S. 1894 that extend eligibility of both the WaterSMART grants and RIFIA beyond Reclamation states to Hawaii and Alaska as well as other provisions that have national applicability. I appreciate Senators Feinstein and Boxer keeping my state, as well as others, in mind. We all acknowledge that drought is something that Americans in all 50 states have experienced or should be concerned about. I would like to receive your analysis of how high of a national priority water conservation will need to be in the coming decades and if possible, any key recommendations you have for Congress to consider in making sure U.S. communities can respond effectively.

Response: The Family Farm Alliance has long advocated that a suite of demand management and supply enhancement activities are required to address the immediate and long-term water resource challenges in the Western U.S. Clearly, water conservation is a key component in the "demand management" part of this equation. However, while agricultural water conservation can help stretch water supplies, it also has its limits.

Conservation efforts for both urban and agricultural water users are not evenly distributed across the West; certain agricultural districts are some of the most efficient in the nation while others have significant room for improvement. Conservation opportunities may exist on-farm or within the water conveyance and delivery infrastructure, or perhaps both, but there are limited financial resources to fund such improvements. Funding partnerships have allowed for extensive system improvements and conservation programs to be implemented in some agricultural districts over the last twenty-five years in exchange for water supply benefits based on these increased efficiencies. Geographic location also plays an essential role in some water systems' efficiency as certain areas return a high rate of diverted water back to the river system, while other areas – either due to high water-use efficiencies or because of their distance from the river – provide minimal return flows to the river.

Agricultural water users know how to manage limited water supplies, and water conservation infrastructure has become a useful and effective water management tool. If farmers normally use 20-24 inches of water in a growing season, they sometimes have to make do during drought with only 16 inches, or less. Local irrigation districts often operate as an in-house water bank, and work with their farmers to manage the limited water supplies: some manage cropping patterns on land as part of rotational operations, put in more efficient field irrigations systems such as sprinklers or drip systems, plant less water-intensive crops, or apply deficit irrigation for certain crops such as wheat or alfalfa. In high valley meadows where ranchers are running cows and raising grass, smart operators ensure water demands for cattle are met by reducing herd numbers.

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While water conservation in irrigated agriculture has proven effective in reducing water diversions and saving water for other uses, in some instances it may have negative impacts. Reduced return flows back to rivers and streams, and less seepage to groundwater aquifers can result from water conservation techniques, resulting in unintended impacts to other users and the environment. However, one secret to successful water conservation has been found through using a more holistic approach to water management decision-making by integrating the management of water resources on a watershed or system-wide basis. Water conservation technologies have dramatically improved over the past decade and do have a place in integrated water management programs.

In summary, water conservation investments in all sectors can improve the long-term reliability and sustainability if the conserved water benefits the system.

Question 2: I appreciate the discussion provoked by the hearing, as it is very timely and important and I think folks in other states have a lot to learn from the situation that California is currently experiencing. I would like to hear from you, given your personal experience with Family Farm Alliance, about your advice on how folks in other states should be thinking about long-term water use and conservation on an individual level. As we know from experience with the recycling and energy efficiency movements, it takes a while to change lifestyles.

Do you think it would be helpful if there was some kind of federal incentive available to individuals to conserve water and thus increase awareness of the impacts that our daily activities have on water sources? For example, changing federal programs to incentivize water conservation, efficiency, and reuse either when infrastructure is being built or retrofitted with federal money.

Response: Your question is a timely one. Our organization works closely with the National Young Farmers Coalition (NYFC) which earlier this year conducted a survey of hundreds of young farmers in the Colorado River Basin. The survey is notable for two key findings: 1) Water and climate variability are two of the top agricultural concerns of young farmers in the West; and 2) Young farmers prioritize water conservation and most of them are already conserving water. Conservation is not a choice for many farmers - it is embedded in the very way they do business.

Young farmers were also questioned about some of the very topics you raise in your question, and the answers are similar to what many farmers and ranchers of all ages believe. Most farmers and ranchers believe they are stewards of the land and are voluntarily undertaking conservation measures without prodding from the government. They believe the government has a role and a duty to: 1) reach out to these producers, educate them on funding and cost-share opportunities, and make it easier for them to conserve; 2) educate the public and policy makers on the importance of these endeavors; 3) prioritize and expand on existing conservation funding assistance programs, wherever possible; and 4) find ways to ensure that producers understand the

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limitations, privileges and opportunities associated with their water rights.

There are also opportunities to improve water use efficiency and supply reliability through coordination of traditional Farm Bill on-farm programs and irrigation district access to Bureau of Reclamation programs like WaterSMART. The “Bridging the Headgates” of the past (i.e., improving coordination between on-farm (USDA) and irrigation district-wide (Department of the Interior) programs) is something for which we have long advocated.

Finally, water resources in the West are managed and allocated by the states themselves, and federal incentives to manage water differently sometimes come with federal strings attached, creating a disincentive for many states. The federal government must recognize and abide by state laws, regulations, court decrees and treaties in creating any incentives to value and manage water differently in the West.