PROCEEDINGS

Mini Summit on Water Security in the Western US
August 18, 2020

WAAESD
Western Association of Agricultural Experiment Station Directors

Report Finalized September 12, 2020
Mini Summit Organizer
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Introduction

The Western Association of Agricultural Experiment Station Directors (WAAESD) held a virtual “Kickoff” meeting for the Mini Summit on Water Security in the Western US on August 18, 2020.

Water is a scarce commodity in the Western Region and is projected to be a limiting resource for Western agriculture and natural resource management in the future. A reliable source of clean water is critical to maintaining strong communities, sustaining and developing rural economies, supporting agricultural productivity, sustaining ecosystem function and wildlife habitat, and maintaining a high quality of life. Targeted research and education will play an important role in addressing challenges of water security. The concept of hosting a mini summit on Water Security in the Western US evolved as a mechanism for WAAESD to address a key issue identified in The Western Agenda.

With USDA-NIFA funding to host a Mini Summit on Water Security in the Western US (Proposal No. 2020-04914), WAAESD originally intended to convene leaders of multistate research projects and activities in Boise, ID to create transdisciplinary teams of professionals who will contribute to the attainment of enough water with proper quality to meet future demands of the Western Region. The COVID-19 pandemic changed the original plan and forced the Mini Summit to go to a virtual format. A multi-step approach has been chosen as the course to achieve the goal of the Mini Summit, starting with the “Kickoff” meeting.

The “Kickoff” for the Mini Summit meeting reported on here is the first step towards creating transdisciplinary teams from the suite of existing Western Region programs currently supported by USDA. The program has been arranged to focus on three themes outlined in the USDA Science Blueprint. The three themes for the “Kickoff” meeting are:

- **Sustainable Intensification** - Discovering, fostering, and implementing advances in production, technology, and management that will allow agriculture to primarily intensify productivity while enhancing sustainability.
Environment and Climate Adaptation - Ensuring that agricultural lands, national forests, and private working lands are conserved and restored to make agriculture production more resilient to climate change and other disturbances.

Science Policy Leadership - U.S. agriculture requires a vibrant, innovative community of leaders who set forth an aggressive ag science agenda to support science-based policy decision making.

This report presents the outcome from this meeting.
The broad purpose for the meeting was to share information about desired WAAESD work on water security in the Western US and to brainstorm some initial thinking about how that work might begin. To this end, the following agenda combining plenary and breakout sessions was used.

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<thead>
<tr>
<th>Approximate Start Time</th>
<th>Topic</th>
<th>Facilitation Process or Activity</th>
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<tbody>
<tr>
<td>9:30 AM</td>
<td>Pre-Meeting – log-in early please</td>
<td>Open Zoom meeting room; general conversation with early arrivers; encourage participants to log in early to resolve connection problems joining the session</td>
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| 10:00 AM              | 1. Plenary – On-Time Start Welcome / Get Started | Presentation: Meeting Purpose  
1.1 Facilitator convenes; on-time start  
1.2 Welcome by Bret Hess  
1.3 Facilitation team introduction and meeting process overview |
| 10:10 AM              | 2. Plenary - Review of Project Proposal | 2.1 Presentation of project proposal for work to increase the influence the Consortium re: water management in the West by accomplishing the three objectives: 2.1.1 Create a project to select Priority (work emphasis) Topics 2.1.2 Create a project for an ‘Audacious Proposal’ to influence work in these topics 2.1.3 Create a project to enhance Consortium and member credibility and use by decision makers  
2.2 Discussion - clarification Q&A only |
| 10:30 AM              | 3. Plenary - Information Sharing | Introduction  
3.1 Presentation: Deputy Under Secretary USDA REE, Scott H. Hutchins, Ph.D. to outline the USDA Science Blueprint  
3.1.1 Sustainable Intensification  
3.1.2 Environment and Climate Adaptation  
3.1.3 Science Policy Leadership  
3.2 Presentation: Bret Hess to define the need for the project and proposed work emphasis issues |
| 10:50 AM              | 4. Next Steps Information Sharing | 4.1 Presentation on Draft Work Plan  
4.1.1 Time frame  
4.1.2 Desired types of member participation  
4.1.2.1 Leadership/Plan Team  
4.1.2.2 Task Teams  
4.1.2.3 Member participation  
4.1.3 Anticipated Workflow  
4.1.3.1 Asynchronous online ‘meetings’ (e.g., blogs, discussion forums, wikis, shared authoring documents, ??)  
4.1.3.2 Synchronous meetings (e.g., Zoom)  
4.1.4 Present the selected Planning Team members and their role  
5.3 Plenary to receive the reporters’ summary of the findings from each breakout group; a discussion of the findings from all breakouts  
5.4 Plenary continued for discussion of the findings from all breakout rooms |
| 1:20 PM               | Plenary - Closing | Closing comments from participants  
Evaluation (online tool)  
Facilitator’s closing  
Sponsor’s Closing (Bret Hess) |
Registrations

Here are the registrants; attendance was not recorded.

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**Plenary Presentations Slide Shows**

**GOAL**
Create Consortium of inclusive transdisciplinary teams

**Objectives**
Select Priority Topics
Create an Audacious Proposal
Enhance Credibility and Use by Decision Makers

**Draft Work Plan**
Timeframe
Desired types of member participation
Leadership/Plan Team
Task Teams
Member participation
Anticipated Workflow

Asynchronous online 'meetings'
Synchronous meetings
SUSTAINABLE AG INTENSIFICATION

World population will likely grow by 20% to 9.7 billion people over the next 30 years and demand for the goods and services provided by farm and forest lands will increase by about 40%. Agricultural and forest lands will need to be more productive to meet this demand.
IMPORTANCE OF SOIL HEALTH

WATER-USE EFFICIENCY

Enhance and protect natural resources

• Erosion Modeling
  • Understanding wind and water erosion processes, implications to production systems
  • Management to conserve soil and enhance water infiltration

• Nutrient Movement
  • Modeling the movement of nutrients (and other inputs) within and out of production systems
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AG CLIMATE ADAPTATION

New strategies and management practices must be developed to allow unmanaged and managed systems to be fully leveraged to mitigate and address a changing climate. While mitigation is a priority, agricultural systems must nonetheless adapt to the changing weather patterns and temperature regimes to ensure food security.
CLIMATE VARIABILITY

IRRIGATION SYSTEM ADVANCES

Irrigated acres and applied water use, 17 Western States, 1984-2013

Source: USDA, Economic Research Service using USDA, National Agricultural Statistics Service, Farm and Ranch Irrigation Survey (FRIS) data. Note that FRIS reports on-farm water applied, not withdrawn; this chart excludes irrigated horticulture crops under protection.
IRRIGATION AND WATER MANAGEMENT RESEARCH EXAMPLE

- ARS researchers measured significantly low rates of nitrous oxide emissions associated with subsurface drip irrigation, a climate-friendly system with minimal nitrogen export to the environment.

- ARS scientists and partners found that during a year with less than average summer rainfall, corn irrigated with a mobile drip irrigation system required at least three inches less water for similar yields.

AG SCIENCE POLICY LEADERSHIP

U.S. agriculture requires a vibrant, innovative community of leaders who set forth an aggressive ag science agenda to support science-based policy decision-making.
Global Agricultural Science Policy Leadership

- U.S. Science Values and Assertions
  - All policy, rules, and regulations should be based on credible, repeatable, and peer-reviewed science

- Innovation will suffocate if not provided space to explore and hope to succeed
  - Entrepreneurs will seek incremental vs. transformational discoveries
  - Consumers will be uneducated and distrustful of science and their food
  - Progress requires technology -> technology requires innovation -> innovation requires science
USDA Agriculture Innovation Agenda

- Research: Develop a U.S. ag innovation strategy that aligns and synchronizes public and private sector research to target the innovative solutions needed over the next 10- to 30-years.

- Programs: Align the work of USDA customer-facing agencies and integrate innovative technologies and practices into USDA programs to help fast-track their adoption by producers.

- Metrics and Score Card: Review USDA productivity and conservation data, and develop benchmarks in five areas* enabling USDA to evaluate its progress and maintain accountability.

* ag productivity, forest management, food loss and waste, carbon sequestration and greenhouse gas, water quality, renewable energy

TECHNOLOGICAL INNOVATIONS

Source: USDA Economic Research Service

USDA Science "Cultivating Scientific Innovation"
U.S. AG INNOVATION STRATEGY

Validate Innovation Theme Clusters

Ag Organization Workshops to Prioritize

Propose and Tests Goals/Application Matrix

NAS Report: Science Breakthroughs...

- Genome Design
- Digital / Automation
- Prescriptive Intervention
- Systems Based Farm Mgt

Ag Applications

Research Goals Public Sector

Inform Product Goals Private Sector

Ag Innovation Strategy

THANK YOU

&

STAY CONNECTED!

@USDAScience
Results from the Breakout Sessions

Breakout brainstorming sessions were held for,

- Sustainable Intensification (one breakout group)
- Science Policy Leadership (one breakout group)
- Environment and Climate Adaptation (two breakout groups)

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Results from the Sustainable Intensification Breakout Group

Facilitator: Judy Weber
Reporter: Freddie Lamm

Question 1: Who are the target audiences we need to influence?

- Stakeholders - full range
- End users
- Farmers
- Consumers from an urban lens need to be supportive and understand benefits
- Consultants
- Technical Service providers
- Conservation districts
- Extension specialists
- Environmental Conservation groups - wildlife advocates
- Ecological services groups
- Political leaders
- Potential funding agencies
- Investors
- Federal agencies - agriculture in general
- State agencies - agriculture in general
- Local and municipal governments, also counties
- People in general need to be informed and buy- in to ideas.
- Recreational users in general - boaters, rafters
- Timber users
- Food, livestock, ranchers a wide variety of consumers.
- Competing objectives with each of these groups - need to be viable for all of them.
- Educational community will help us reach other audiences
- K12 system - imbed these changes into it.
• 4H programs for kids (water conservation); FFA.
• Water district irrigation districts (country regional agencies)
• Tribal Water Districts

Question 2: Where do we want to move them?

• To a higher important state
• Consensus on a common good
• Do we need a common goal or actions that everyone can agree to.
• Populace is under-educated in science - how do we increase their knowledge specific to this area?
• Education to the common good that can be achieved.
• There is a tragedy - make a conscious effort to avoid those bad outcomes.
• Understand common tragedy
• See how this will benefit them
• Understanding the different colors of water and the best uses of each
• Cost of moving water from one color to another.
• Move them to a direction where they will invest or sacrifice in a common solution. Everyone will need to give up something so we can have a solution.
• Understanding of prior use, prior inequities, prior appropriation law, a lot of informal prior use that was inequitable - formal and informal. How to address this.
• Explain the magnitude of some of the issues.
• Increase the passion they have for the land and the resources - they will pay more attention
• Recognition that you can’t have everything.
• Must prioritize.
• Can show through studies to be a win-win situation. There is potential to move forward together
• Zero sum game pretty apparent in our history. Let’s build a bigger pie rather than fighting over smaller pieces. Synergy between other disciplines.
• Green lawn vs food. Should you grow certain crops that need a lot of water in a low water area. Can we use different language regarding the role of govt.
• Diff crop types that don’t belong there. Desert plants in desert area. Need to discuss planning and moving things around for water not just convenience.
• Do you limit urban use of high quality for lawns. How do you thread that needle.
• Have understanding that there are competing uses that need to be kept in balance. Who needs to understand this? Publics, ranchers, producers? All need to understand the trade-offs.
• Is there historical precedence on water right and is it the best for society right now.
• Water is power.
Question 3: What method to move them should be considered in our 'Audacious Proposal'?

- Redefining state boundaries according to watersheds.
- Don’t be limited by state boundaries but by area of common use.
- Hold listening sessions where one type of use is listening to another groups needs for use.
- Educational processes - Extension.
- What do different water futures look like and what does this do for different audiences?
- Provide modeling as Gore did for climate change futures.
- Do a better job in intertwining research and education. Data gets lost in journals. Need to understand what we have already learned - improve its value in solving problems today.
- More data doesn’t always solve the problem.
- Most people make their decisions based on their values not data.
- Adoption of the “one water” policy.
- Public won’t pay attention unless info is pertinent to them. Demonstration areas. Select a few houses in a neighborhood to show how to save water and money and other benefits.
- If we don’t increase house efficiency there won’t be $ for ag, the foods we want to eat might need to change, take a socio-economic approach. Linkage of choices. If you choose “A” you limit other choices.
- Employ social marketing, multiple messages for same point for different audiences.
- Your green lawn leads to extinction of salmon…, ultimately Orca.
- Revise how we educate people. Covid lessons may help us. We don’t understand cell phone science, but we love our phones. We are not programming; the cell phone companies just give us what we like.
- Integrate social scientists more into our efforts in education.
- Give economic incentives to implement certain practices. Tax benefits for reduced water use.
- Laws have been written in terms of ground and surface waters - they need to be considered together.
- Difficult to push tech on people. Better to pull it through the economic system. Water-efficient food production - people might pay more for this. Penalties for bad acts (wasting water).
- The above implies there is a correct way to manage water and we may not have agreement on that.
Science Policy Leadership Breakout Group

Facilitator: Joel Greene
Reporter: Leslie Edgar (Scribe)

Question 1: Who are the target audiences we need to influence?

- Urban public
- Environmental community (in a positive way!)
- Water managers at different scales/jurisdictions/all stakeholders in decision making...
- Tribes
- State legislators/federal lawmakers and agency reps (USDA, USBR, etc....)
- Producers
- All water users subject to constraints (could be entire gamut of water users)
- Consumers in the marketplace...
- Future generations... (today’s youth/K-12/16) ... inclusive of diversity in the population
- Individuals working on ecosystem services

Question 2: Where do we want to move them?
(need to be diverse ways to move people!)

- Competitive environment for water use exists in most of the west, change that to cooperative
- Connectivity... bring ecosystem parts together holistically
- Sense of collective good... counter the intense individualism... move in a common direction in the body-politic
- Move ppl to have a holistic view of the water ecosystem
- General education about water for the public
- Increase the knowledge base about the usage of water
- Move existing water users from being skeptics to believers (in re: the USDA advice?)
- Elevate knowledge base to help positively influence policy
- G. Paige asked about what is the direction we want to move towards?
- Re-evaluate how we do water storage... i.e. how do we deal with climate change impacts on precipitation patterns
- Getting society to think differently about recycled water
- Rethink how we look at basins... what scale are we setting our targets/needs...
- Urban agriculture: educate local managers of water
- Training urban leaders
- Use of water in hydroelectric production...
- Water markets (better understanding of what works and doesn’t work)
Question 3: What method to move them should be considered in our audacious proposal?

- Inspiration!
- Regulatory changes... changing the framework can move behavior
- Policy changes
- Mechanism to create a foundation with the goal of this summit
- Policy changes... at what level though? Local/State/Federal?
  - COMMENT: separate out what type of water is being dealt with by a certain policy? Probably local scale first... then state for broader level policies
- Mechanisms or tools for stepping through these processes... (change policy at the small scale first...different stakeholders will have different responses to policy suggestions)
- Envision an incentive-based policy framework
- Economic analysis as part of the process
- As part of the messaging... quit talking about urban/enviro/ag... it’s water that serves all three at the same time...
- Education and extension...
- Connectivity of all of the uses and users of water... selecting the tools depends on where we want to the public to transition towards
- Roundtables/watershed councils Education/engagement (reach out to the users, what do they want? Believe in? how to change their habits that they can agree with?) “mutual understanding/mutual engagement”
Environment and Climate Adaptation Breakout
Group A (one of two on this topic)

Facilitator: Terry Teale
Reporter: Paul Gepts

Question 1: Who are the target audiences we need to influence?

- Non-traditional innovators
- Federal/State/Local policy Makers
- Consumers/Broad Public
- End-Users/Producers/Public
- Funders/Potential Funders
- Non-Profits
- Water Management Institutions
- Interstate Users/Cross-Regional Policy Makers
- Water Rights/Water Law & Policy
- Decision Makers
- For-profit Sector/Technology Industry
- Land Managers (Local/Federal/Private/Non-profit)
- Native Populations/Underserved populations
- Professional Associations
- Scientists and Researchers
- Educators
- All Generations of the public

Question 2: Where do we want to move them?

- State Level/Federal Level: Appreciation that Western Ag is sensitive to snow-melt - urgency in dealing with this. Warming has major impact.
- Urban growth impacts demand/scarcity of resource
- Efficiency of use: Facilitation on how to use water “efficiently” (Education and action)
- Understand assumptions and realities of where constituents currently are before “moving them”.
- Awareness of diversity of constituents/their needs/representation/access to information and resources/ability to effect change
- Move them to be inspired to make change
Question 3: What method to move them should be considered in our 'Audacious Proposal'?

- Science!
- Share-based Appropriations/Allocations
- Inter-state Forums involving researchers, water officials and managers
- Collaboration
- Institutional Change
- Collaborate with Professional Associations
- Evaluate economics of water policies/consumption
- Social Media/Non-traditional communication outlets
- State and Local Government incentives: grants, policies, etc.
- Stakeholder Engagement throughout the process
- Case Studies/Stories
- Education (New and novel ways to educate - local to federal levels across generations)
- Creative ways to share information
Question 1: Who are the target audiences we need to influence?

- Policy makers
- Water resource managers
- Land managers
- Tribal colleges and universities (100’s of universities)
- Tribal policy makers
- Non-traditional, high-dollar funding resources (Who are they?)
- Private business
- Green Investors
- Municipalities are heavily invested already
- Venture capitalists
- Risk taking entrepreneurs like Elon Musk
- Where are we heading- future target audiences- who are they
- Do we know where our food producing areas/regions will be in 50-100 years, this target may be shifting
- Ag producer industry
- Address the water use side as well
- Economic Development Agencies/Authority
- Crop Genetics breeders and shifting focus to water productivity
- Broad water research community as a partner- research needs to be strongly integrated into this

Question 2: Where do we want to move them?

- Collaboration of advocates and allies
- Funding from funding sources/stakeholders
- Support from policy makers
- Move them into a more collaborative arena
- Every decision related to water in the west is related to water law there is lack of flexibility in what we can do. Perhaps part of our audacious proposal is to suggest a better way to manage western water than how it is currently being managed.
- This is a social, political, and legal issue. There needs to be more public dialogue and education about water scarcity
- The consortium must have legal, social, and scientific components.
Question 3: What method to move them should be considered in our 'Audacious Proposal'?

- Increase public awareness and education about water scarcity
- Collaboration of funding from non-traditional sources such as policy makers, farmers, ranchers, and foresters
- Take into account history and legal issues when looking 50-100 years into the future
- Such a massive topic- break it down into manageable parts
- Science, technology, and practitioner loop so that people and research is related

Other Material that Was Discussed

- How do we prioritize these ideas to meet outcomes (formulated during target audiences discussions)
- Where does research and science fit in (additional research questions that need to be answered)
- Are water law agreements still relevant today? Will they be relevant in 100 years? How can we work with something that seems so fixed

Transcript of the Chat

- Goal: Create a consortium of inclusive transdisciplinary teams attain ample water of proper quality.
- Objectives: topics, proposal, enhance credibility/use by decision makers.
- Audacious: Resilient western agriculture and the environment strengthened via reduced water scarcity even in the face of climate change.
- Ag Climate Adaptation Group: Charged with thinking about the world as it will be. Charged with sharing a vision, solution, and what we will need in the future.
- Break out room: Mary Billerbeck.
- Team: Kyle, Steve, Travis, Randall, John Philips.

Who are the target audiences we need to influence?

- Noting that who our target audiences depend upon outcome we hope to realize.
- Non-traditional funding sources: could the primary target be the funder of the effort, goals of the funder, thus they are an important target audience for this idea.
- Expand thinking into private business and/or green investors. Risk taking entrepreneurs.
- Municipalities are heavily invested. And are spending a lot of money and time in their watersheds.
• Where are we heading: ensure we are producing food in the best area suited for food production in 50 years. Do we know where our food producing areas? Our target may be shifting.
• If you want to be the ‘go to’ intellectual resource for water related issues/needs, it allows us to target organizations.
• Must address the water use side. Ag producer industry: producers, consultants, and advisors.
• Climate change: Ag to urban transfers. Promote rural communities in a way to promote water where it has historically been. Economic Development Agencies.
• Research needs to be included in some way.
• Crop Genetic developers - to focus on hydraulic properties of crops, not just yield.
• Meaning: different groups of stakeholders: primary, secondary, think outside traditional ways of doing things.

Where do we want to move them?
• A cadre of advocates, allies, and champions.
• Funders to fund us
• Policy makers to support it
• Move them into a more collaborative and vision arena.
• Every decision related to water in the west is related to water law and compacts: there is very limited flexibility in what we can do. Perhaps part of our audacious proposal is to suggest a better way to manage western water than the current compacts/prior appropriation.
• There needs to be more public discourse about the idea that water is limited. This is a social, political, and legal issue. A more educated public about water scarcity.
• Consider this: Are the compacts relevant today? Will they be relevant in 100 years? How can we tinker with something seeming so fixed.
• The consortium must have legal, social, and scientific components.

What method to move them should be considered in our audacious proposal?
  • Very rich discussion so we didn’t get to this question, but I (Mary) pulled:
    • Consider history and legal issues. In light of future 50 to 100 years.
    • Increase public discourse and awareness about water scarcity:
      • Collaborative - funders (non-trad), policy makers, farmers, ranchers, forester,
      • Huge topic, so breaking it down into manageable parts is important.
      • Knowledge Co-production. Science, technology, and practitioner loop so that people and research are related: knowledge co-production.