

Governor's Water Augmentation, Innovation and Conservation Council Long-Term Water Augmentation Committee May 22, 2020 Meeting Summary

Time: 10:00 a.m. – 12:00 p.m.

Webinar Only

I. Welcome and Opening Remarks

Chairman Wade Noble called the meeting to order and welcomed all those who joined to the first virtual meeting of the Governor's Water Augmentation, Conservation and Innovation Council Long-Term Water Augmentation Committee meeting. One hundred and thirty-eight participants joined the meeting online.

Chairman Noble stated that the Committee decided at their last meeting in January to pursue the consideration of three additional augmentation options: weather modification, grassland/forest management and phreatophyte management. Chairman Noble had asked Chuck Cullom, Bruce Hallin, The Nature Conservancy and Sarah Porter to research assigned potential augmentation options and report their results to aid the committee in understanding the issues, science, challenges and opportunities of each method. With this information to assist them, the committee will discuss and decide whether or not to recommend the addition of each potential option to the *Long-Term Water Augmentation Options for Arizona* report.

II. Potential Water Augmentation Options for Committee Consideration

{presentation slides are posted on the Committee's website at https://new.azwater.gov/sites/default/files/20200522_LTWA_meeting_presentation.pdf and the full recording of the presentations and meeting posted at https://www.youtube.com/watch?v=xb-L_eNqvdU}

a. Weather Modification: Chuck Cullom, CAP

Mr. Cullom's presentation covered the following:

- History of snowpack augmentation (aka cloud-seeding or weather modification) across the arid western United States
- Science and application of winter cloud seeding
 - required meteorological conditions and the seeding process
- Efficacy of snowpack augmentation programs
 - Wyoming Weather Modification Pilot Program (2005-2014): Results - 5-15% increase in precipitation
- Potential of extra-area effects ("robbing" rain that would have fallen elsewhere)
 - increase precipitation downwind, rather than depletion
- Environmental impacts of seeding materials (silver iodide)
- Recent studies results (2018 & 2020):
 - radar signature (direct evidence) showing additional ice/snow being generated into the cloud
 - cloud seeding will not ameliorate a drought since it needs existing clouds, but can create additional precipitation in the right conditions

b. Forest Management to Increase Runoff: Marcos Robles, TNC

Mr. Robles presentation covered the following:

- Empirical data that support forest thinning as a water augmentation strategy:
 - studying (2014) the efforts of the Four Forest Restoration Initiative to improve forest fire resilience and to increase runoff in the Ponderosa Pine forest of northern Arizona; result: overall average 20% increase runoff at the headwaters in thinned forest, 1-9% increase to municipal water supply and, 1-3% increase to the Salt-Verde system (the larger the watershed the smaller the increase)
 - other simulation models showed a 2-3x reduction in crown fire risk and 13% reduction in ET losses
- Conclusion: more research needed to study durability of thinning, warmer temp effects, snowpack and soil moisture effects
 - thinning is more cost effective to pre-emptively manage forest than to clean up after fire

Forest Management to Increase Runoff: Bruce Hallin, SRP

Mr. Hallin gave an overview of SRP's long-term studies in progress across the Salt-Verde Watershed addressing the effects of pre- and post-restoration efforts on water supply, water budget, carbon benefits and ASU modeling. Preliminary data is expected late spring and summer 2021.

c. Phreatophyte Management, Sarah Porter, Kyl Center

Ms. Porter presented the results of a literature review and interviews with subject matter experts regarding phreatophyte removal effects on water supply, with a focus on encroaching woody shrubs such as mesquite, *Tamarisk* and *Arundo donax*.

- Removing phreatophyte shrubs does not necessarily result in increased water supply to the aquifer or stream.
- Removal efforts are not generalizable: each ecosystem is complex and highly localized. Critical variables which impact the effect on water supply include replacement vegetation type, soil erosion and sedimentation, ongoing maintenance efforts and cost and amount of precipitation.
 - long-term increases in water yield are likely only when a relatively high leaf area species is permanently replaced by a lower leaf area species.
 - ongoing control/maintenance is costly
 - recommend that some scientists answer questions directly from the Committee
 - recommend multi-disciplinary , long-term, site specific pilot projects are needed

III. Wrap up

Chairman Noble and the participants discussed next steps, concluding that it would be desirable for the panelists to draft a one to two-page summary of the augmentation method based on their expertise and research, with recommendations. The full Committee will have discussion of that information at the upcoming meeting, and may consider taking recommendations to the Council. The chairman, presenters, and staff will coordinate to pull things together with the goal of

reconvening the committee in 90 days.