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Southwest Roundtable, July 23, 2020, v1.0
& DCP Subcommittee slides

2.7 Hydroclimatic variability of the basin Interannual variability.

A critical feature of the natural river system has been the large variability in hydroclimate conditions. Looking first at interannual variability (Figure 2.6), annual precipitation in the Upper Basin has varied by over a factor of 2.1 from the driest water year in the historical record (1977; 11.4”) to the wettest water year (1997; 24.4”). **Because the fraction of precipitation lost to ET is large (on average, 80% across the Upper Basin) and this fraction is greater in dry years and lower in wet years, the natural streamflow of the Upper Basin is even more variable than precipitation, varying by a factor of about 4.5 from the lowest-flow water year (1977; 5.4 maf) to the highest-flow water year (1984; 24.4 maf)**

Western Water Assessment - Temperature and Streamflow

McCabe and Wolock (2007), simple water-balance model, 5% decline in Upper Basin runoff per 1°F of warming.

Vano, Das, and Lettenmaier 2012; Vano and Lettenmaier 2014, More sophisticated hydrologic models (see Chapter 6), 1.5% to 6% decrease (model average: 3.5% decrease) in Upper Basin runoff per 1°F of regional warming (V).

Udall and Overpeck (2017) , approximately one-third (range: 17-50%) of the Lees Ferry streamflow departure from 2000–2014, relative to the 20th-century average, was due to the effects of the warming alone

Xiao, Udall, and Lettenmaier (2018), simulations of historical hydroclimate with the Variable Infiltration Capacity hydrologic model (see Chapter 6), 54% of the Lees Ferry streamflow departure from 2000–2014 was due to warming alone.

Milly and Dunne (2020), different hydrologic model, just over half of the 2000-2017 Lees Ferry streamflow departure was due to warming alone, and that the temperature sensitivity of runoff was about 5% per 1°F of regional warming.

But based on simulations from three global climate models (GCMs) with embedded hydrology (or land surface) models, Hoerling et al. (2019) estimated that the temperature sensitivity of runoff was about 1.5% per 1°F of regional warming, and that about 20% of the Lees Ferry streamflow departure since 2000 was due to warming.

Causes for the Century-Long Decline in Colorado River Flow

M. Hoerling; J. Barsugli; B. Livneh; J. Eischeid; X. Quan; A. Badger

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<https://doi.org/10.1175/JCLI-D-19-0207.1>

Most applications of high-resolution explicit process models have been to support the investigation of geophysical questions in watershed science and ecology, including understanding the effects of beetle kill, juniper control strategies, forest thinning approaches, dust-on-snow phenomena, deglaciation, and groundwater-surface water interactions, among other topics. Until recently, it had been rare to find such models used in water resources applications such as streamflow forecasting or long-term climate change studies. In the U.S., Westrick, Storck, and Mass (2002) implemented a 150-m DHSVM model for streamflow prediction in the Pacific Northwest. More recently and notably, NOAA NWS launched the NWM for streamflow forecasting which coupled a 1-km resolution implementation of the Noah-Multiparameterization Land Surface Model (Noah-MP; Niu et al. 2011) to a 250-m terrain routing scheme (Gochis, Yu, and Yates 2015). See section 6.3 for a more detailed description of the NWM.

Common Pool(Current CWCB Policy) vs. Individual Accounts (My Proposal)

An alternative to the common pool in Lake Powell... individual accounts:

- Water rights holders deposit water, in trust with the UCRC, in return for compact call protection credits
- Time shifting, forgoing use of water now for compact protection later
- Credits cannot be bought or sold
- Credits could only be used to protect the water right that deposited them in event of a call on the Colorado River, UCRC will administer
- Depositors must own the water right on a date to be determined
- Can't deposit water rights bought after this date to discourage buy and dry

A single, relatively simple, sideboard must be passed by the UCRC, places the above restrictions on depositing water into Demand Management Storage

Colorado water law allows buy and dry, this UCRC compact wont for the DM Pool

The Front Range may have wanted this two years ago. River District and SWCD were concerned about Buy and Dry, demanded the current sideboards instead.

An Alternative for Demand Management Pool in Lake Powell

- Perfect alignment between participation and protection
- Reduces incentives for buy and dry and speculation
- Eliminates need for funding, there isn't any state funding at the moment
- Water rights holders choose their own level of risk tolerance and mitigation.
Having these important concerns decided for us by entities with different risk concerns has been and will continue to be the source of endless conflict, really....
- Stretches the inadequate 500,000 AF pool, provides more protection to those who really need it, cities. A full year of protection for Front Range TMD's if no one else participates
- Eliminates free riders, if you don't participate you don't benefit
- Removes "shared responsibility" obligation from unwilling participants, makes "voluntary" really "voluntary"
- Demand Management "Pilot" for Front Range Cities, They've never done one, Actually store water for compact compliance for the first time
- Simpler pathfinder for DM, a few big municipal water rights holders work out monitoring, verification, shepherding, legal

One reviewer may have an issue with this policy on Colorado mainstem

Suggestions for a more productive IBCC

- IBCC/Rountables should choose topics we think are important, not CWCB
- IBCC needs to meet more often (i.e. monthly or every two months)
- IBCC should use Zoom to increase our meeting rate, reduce costs and travel time
- Some in person meetings when Covid situation allows
- Draft Agenda should be sent out for comment, any member can ask for a little time
- IBCC members should attend roundtable meetings in other basins to foster communication, learn what others are doing well, spot common interests or conflicts
- Long presentations should be on video, made available to IBCC and all Roundtables. Don't waste presenters time making them give the same presentation multiple times
- Meetings should focus on short presentations to frame an issue, Q&A with experts, substantive discussion and policy debate
- A collaborative editing platform to write policy docs, any member can start a policy on a topic they choose, CWCB staff can participate but should not be the sole authors of IBCC policy documents. This was DM Workgroup strategy and it worked pretty well.
- When a collaborative doc has traction, the policy is taken to members to discuss
- IBCC voting should be transparent and verifiable by members, votes by elected and appointed members should be recorded separately
- Facilitator's role is to insure smooth flow, especially on Zoom, not to intervene constantly in the conversation, to choose topics, or decide... anything

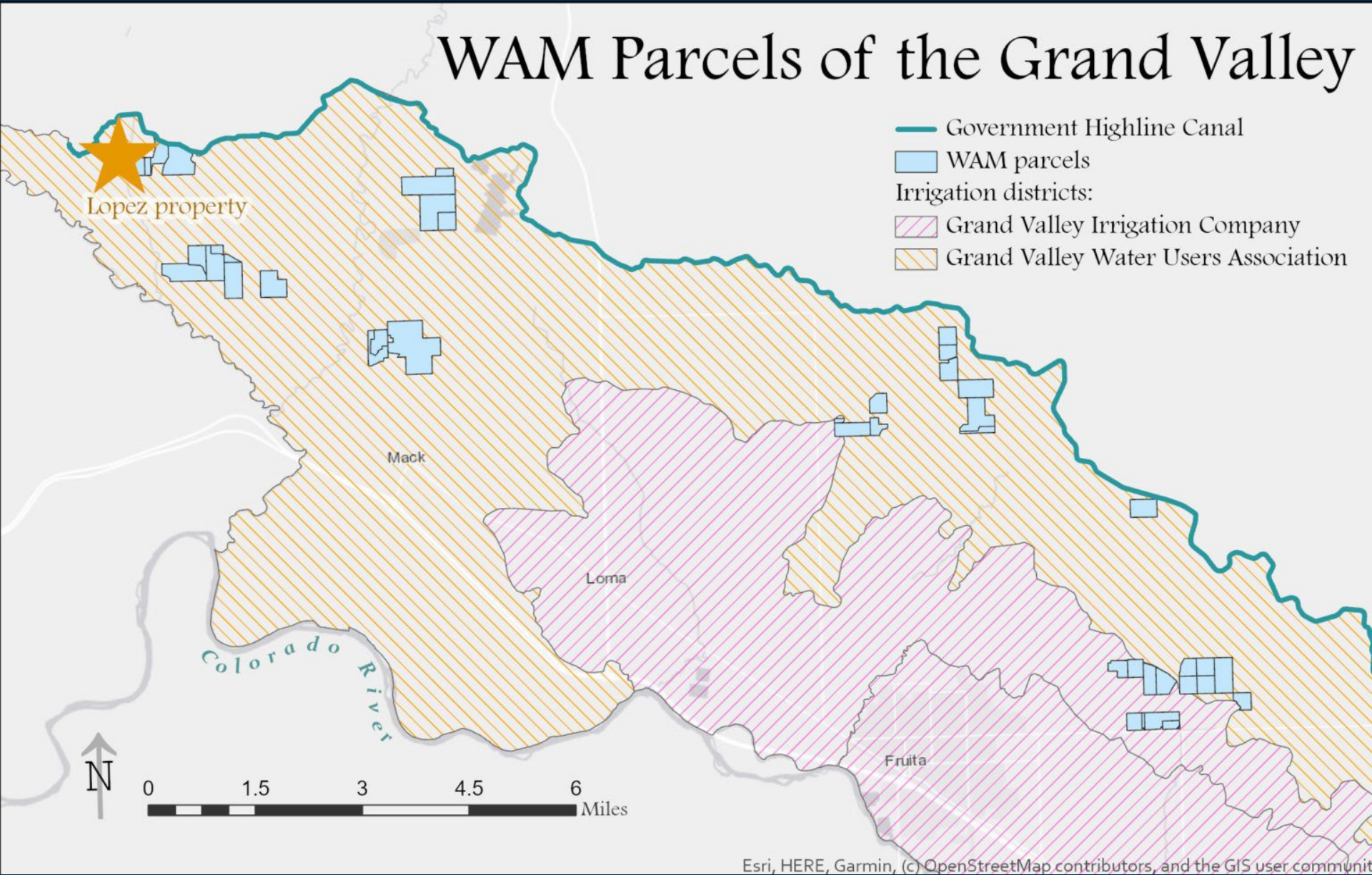
What is the mission of the InterBasin Compact Committee (IBCC)

- A dispute arises between basins within Colorado over water
or
- A major policy needs to be developed on something controversial like Demand Management proportionality or TMD's which reach across more than one basin
- IBCC members negotiate a policy solution acceptable to all parties
- They draft an intrastate compact and sign it
- The compact is submitted to the legislature for ratification
- This is very similar to the interstate compact mechanism which led to the Colorado Compact in 1922 and the Upper Basin Compact, it's a way to resolve and prevent disputes between basins within Colorado
- CWCB doesn't represent all the interests that might have a stake in these complex policies because of its limited number of directors. IBCC explicitly includes a water rights holder from each division, CWCB doesn't. IBCC includes representatives from the state legislature. Governor's appointees represent other important stakeholders like environmental and recreation
- CWCB motions are too easy to change, DM sideboards could be changed at any time
- IBCC compacts would be locked down by the legislature to for policies that require certainty over time

Water Asset Management

- Hedge Fund based in Manhattan
- “Investing” ...or...”Speculating” in water and/or farming
- They’ve hired James Eklund to do legal work:
 - former CWCB Executive Director and UCRC Commissioner who signed DCP, Squire Patton Boggs
 - Seems to want radical change to Colorado water law, end prior appropriation
- Buying farms in Grand Valley:
 - 2,200 irrigated acres so far, goal maybe 10,000 acres (per Chris Treece)
 - Largest landowner in Grand Valley Water Users Association (Reclamation project)
 - Started buying in Grand Valley Irrigation Company (like MVI)
 - They exploit **Debt, Death, Divorce**
 - Installing center pivots on old farms, leasing back to local farmers
- Claim they will sell water from efficiency to DM pool, this probably isn’t true
- Division 7 exemption might discourage part of their business model
- What is the end game?
 - Shades of Mulholland and Owens Valley
 - Accumulate water until a compact call, sell it for an extreme profit
 - Accumulate water, sell to highest bidder (a city) when they have a large block
 - Something else?

WAM Parcels of the Grand Valley



Western Colorado water purchases stir up worries about the future of farming

“Eklund, who comes from a Western Slope ranching family, says WAM’s strategy is to buy irrigated land and then pump money into cutting-edge technology and practices, thereby increasing irrigation efficiency and crop yield. The leftover water could be, in exchange for payment, sent downstream under a demand management program.”

Grand Valley Water Users Association Issued Letter on WAM a week ago:

“The water under the GVWUA system cannot be separated from the land, but we understand that what WAM is doing in the valley can be viewed positively or negatively, depending on your perspective.”

Under Demand Management pilots from 2015-2018 GVWUA **did separate water from land temporarily.**

The End
