



Water Supply and Electricity Planning in the West

Mountain West Water Institute

July 18, 2011

Tom Iseman
Program Director for Water
Western Governors' Association



WGA Background



Through the leadership of the Governors, WGA brings together Western states to:

- Develop policy and address important governance issues.
- Advance the role of the states regionally and at the national level.
- Develop and manage innovative programs related to natural resources, the environment, economic development, international relations, and state governance.

Note: WGA Chair Governor Otter.



WGA and the energy-water nexus

WGA Policy Resolution 10-11 (Energy Policy)

- “The Governors believe that it is critical to examine the impacts of potential future energy generation on our already limited water resources to ensure that the Western States have a broad understanding of our energy choices.”

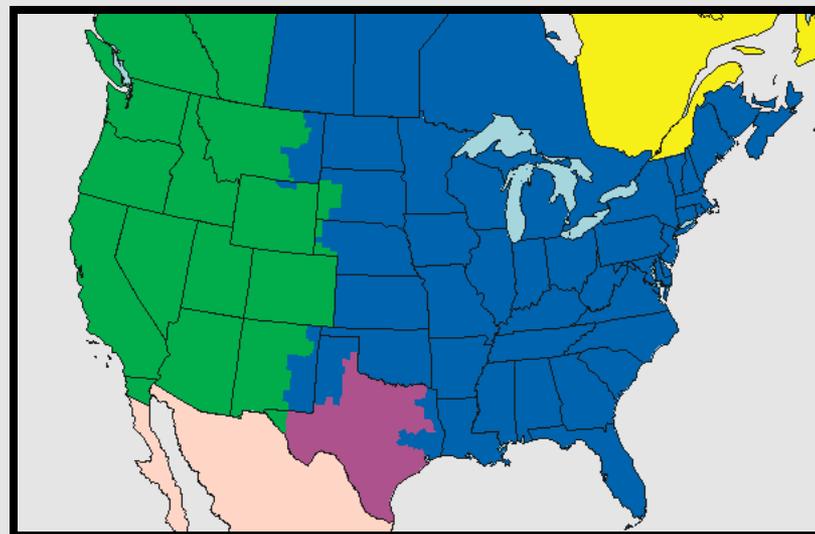
Project Goals

- Integrate water supply into regional transmission planning in the West
- Position the governors to be proactive on future issues regarding water availability and energy development



Regional Transmission Expansion Planning

- An open process to analyze transmission requirements under a range of alternative energy futures to develop interconnection-wide transmission plans.
- Three regional efforts funded by the U.S. Department of Energy
- Our focus is on the Western Electricity Coordinating Council (WECC) and the Western Interconnection



Major North American Interconnections

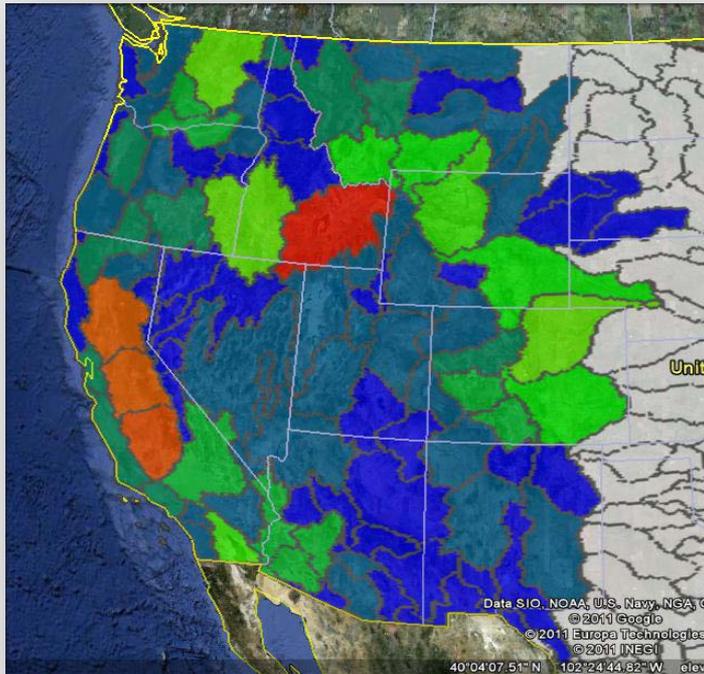


Initial analysis of generation and transmission scenarios

Initial results produced by Sandia, INL and a consortium of labs and universities.

Disclaimers:

- We are focusing on electric generation, not energy development
- Current spatial resolution does not allow site-specific analysis
- Not intended to imply water as the deciding factor in siting of electric generation
- All results are still preliminary



Preliminary conclusions

1. Water demands for thermoelectric generation are relatively small in relation other existing uses.
2. Thermoelectric generation has the potential to drive a significant increase in water consumption by 2020.
3. The projected growth in thermoelectric water demand occurs predominantly in basins that may be prone to water-related stress and where there will be competition for new water supplies from the municipal and industrial sectors.
4. Electricity scenarios perform differently with respect to water withdrawal and consumption, suggesting the opportunity to find engineering and operational solutions.



Future Opportunities with MWWI

Ongoing Analysis for Energy-Water

- Conduct drought/climate change assessment
- Refine assessment of water supply availability
- Integrate water into transmission modeling
- Develop policy options for Governors

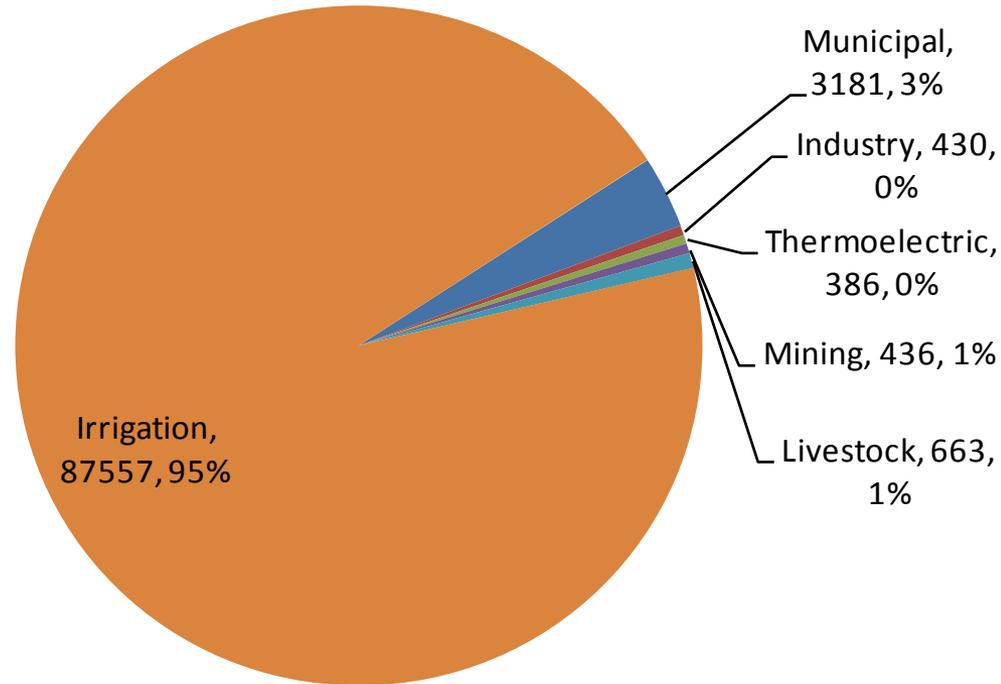
Other WGA Water Projects:

- Innovative water transfers
- Drought and climate impacts
- Forests and watersheds
- See: WGA Policy Resolutions 11-7 and 11-15

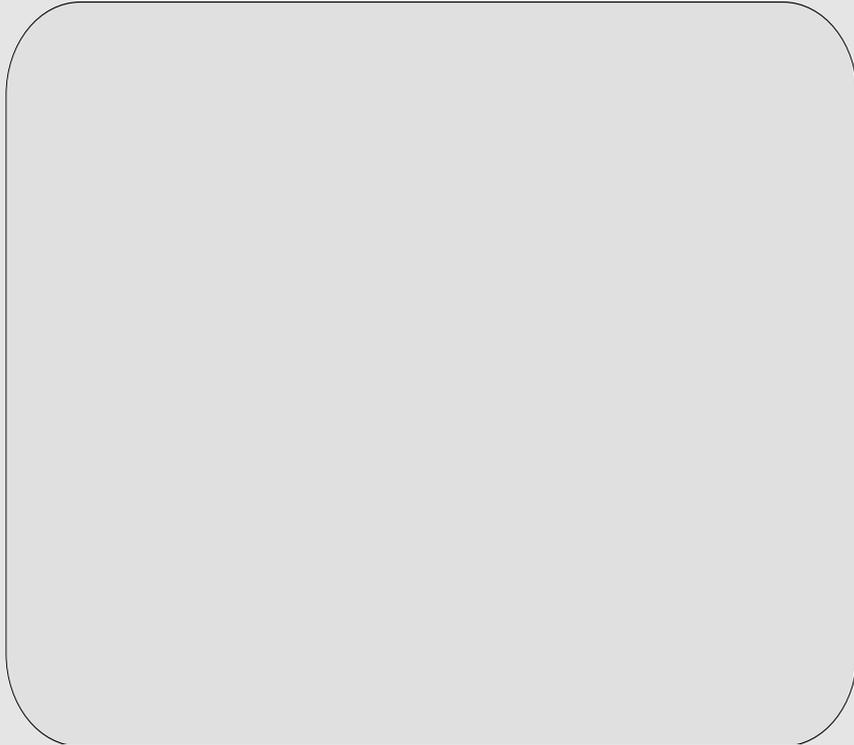


Water demands for electricity are relatively small

2010 Water Consumption (MGD)

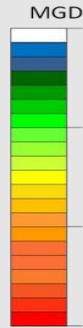
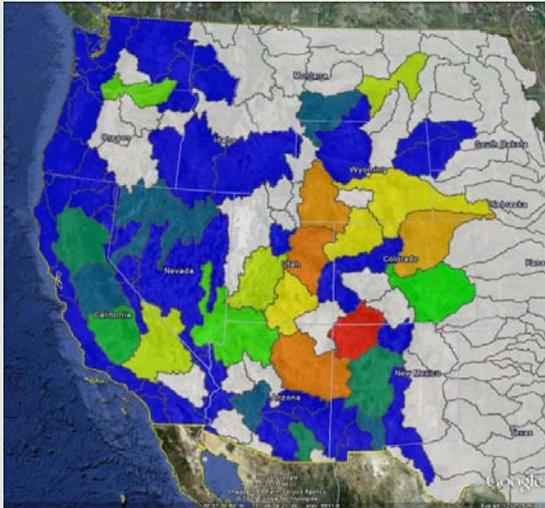


Thermoelectric generation may drive a significant increase in demand by 2020

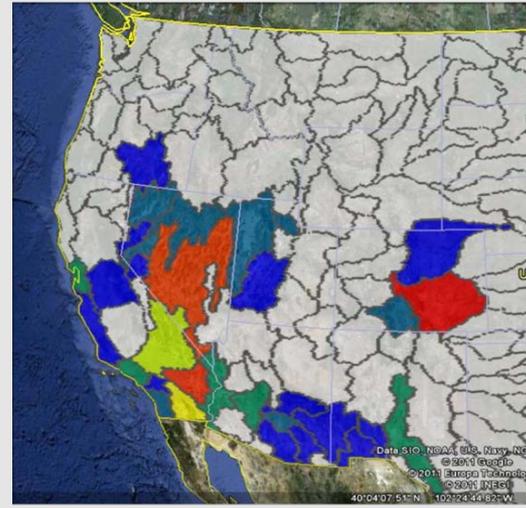


Thermoelectric consumption and risk due to water availability

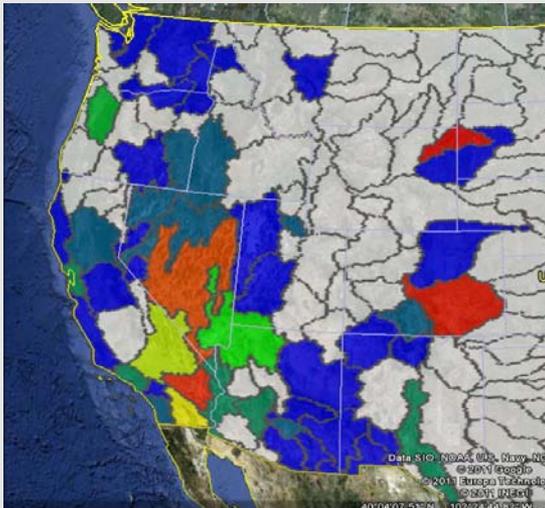
Current (2010) Thermoelectric Consumption



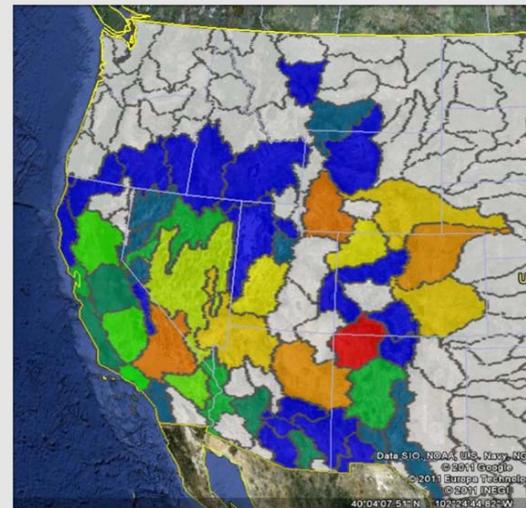
Plants at Risk to Water Supply



Proposed (2020) Thermoelectric Consumption

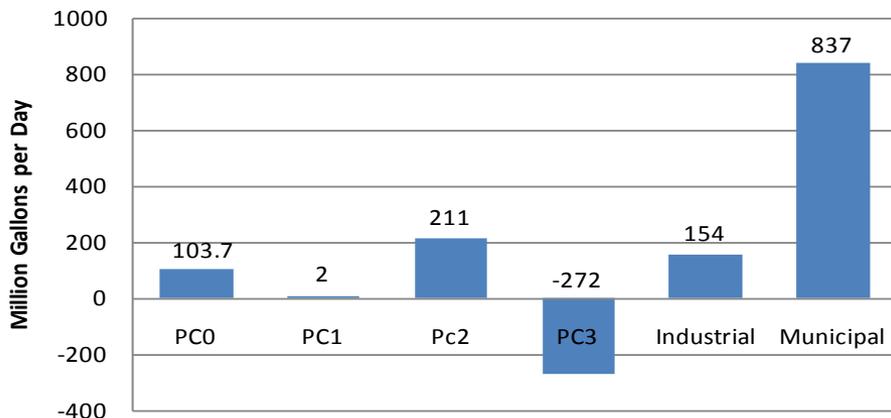


Plants at Risk to Low Flows

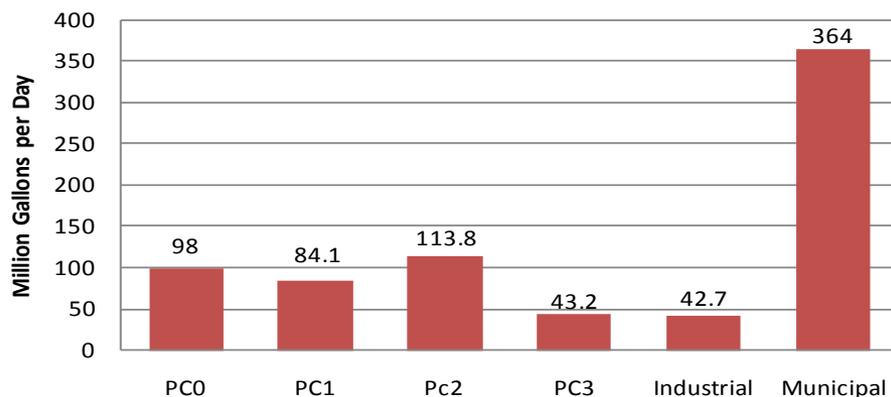


Scenarios perform differently

New Withdrawal 2010-2020



New Consumption 2010-2020



WECC Generation and Transmission Scenarios

- PC0: WECC 2010 Base Case
- PC1: SPSC Reference Case
- PC2: High Load Case
- PC3: Demand Side Management

