Energy-Water Issues in the West

Tribal Leader Forum on Transmission and Clean Energy

February 8, 2012

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About WGA

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

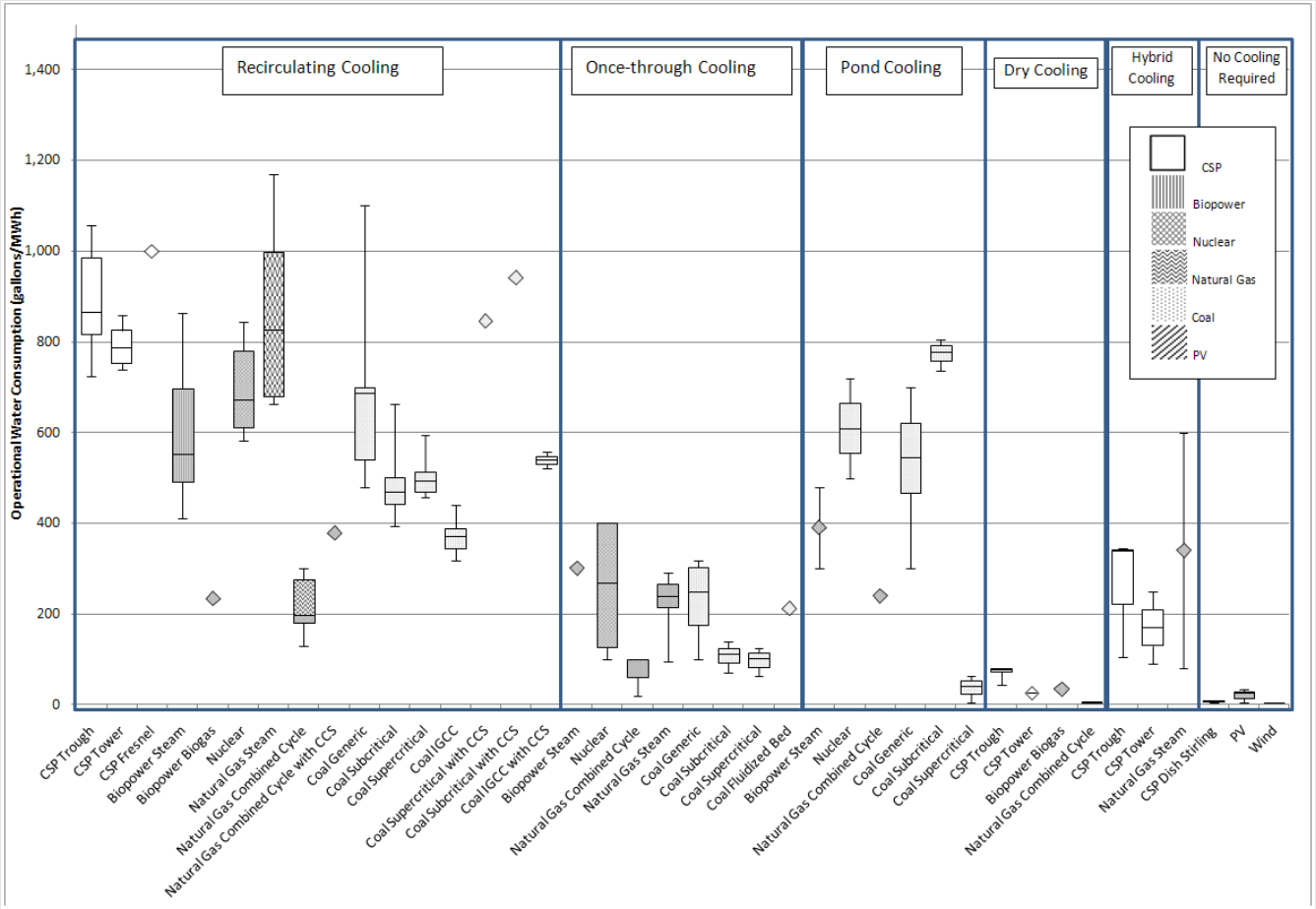
- ☐ Develop policy and address important governance issues.
- ☐ Advance the role of the states regionally and at the national level.
- ☐ Develop and manage innovative programs related to natural resources, the environment, economic development, international relations and state governance.

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."

Energy Generation Requires Water



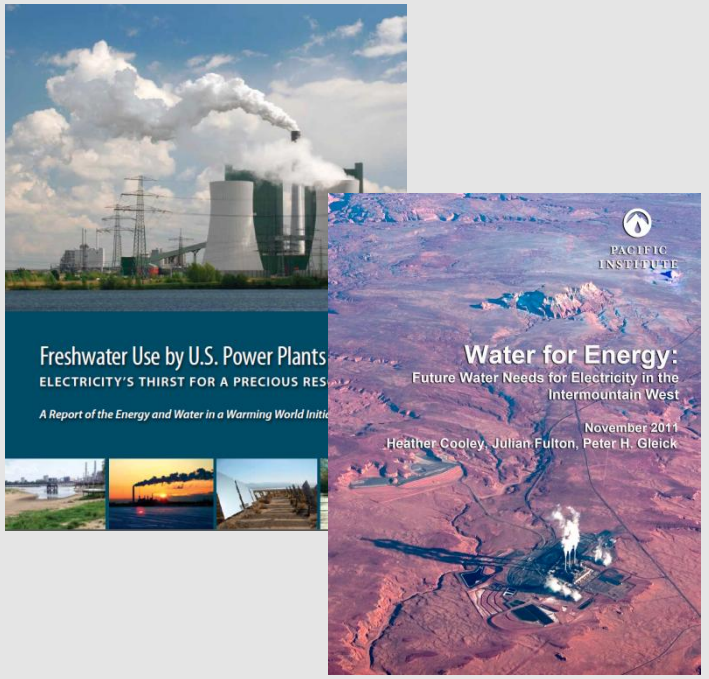
- Renewable energy can require as much water as traditional fuels.
- The cooling technology matters.

Macknick, et al, NREL, 2011.

Energy-Water Conflicts are Surfacing

• Energy-Water tensions are emerging throughout the West, including in Arizona, California, Colorado, Idaho, Nevada, and Texas.

• As state water managers plan for a sustainable and reliable water supply, demands for electricity generation must be factored in.



• This project helps states to understand future proposed generation, to anticipate areas of potential water stress, and to design strategies to meet future needs.

Drought Impacts in Texas

THE TEXAS TRIBUNE

Drought Could Pose Problems for Texas Power Plants

-- by Kate Galbraith (9/16/2011)

- Up to 3,000MW could be affected
  - Of approximately 80,000 MW
- Issues: less water and higher T
- Options:
  - Reducing operations at stressed plants
  - Piping water in from other basins
  - Building new plants that had been 'mothballed'.

Integrated Energy and Water Planning

Project Goals

- Assess how water availability intersects with electric generation in Western States
- Formulate regional policies and analytical tools for the Energy-Water Nexus

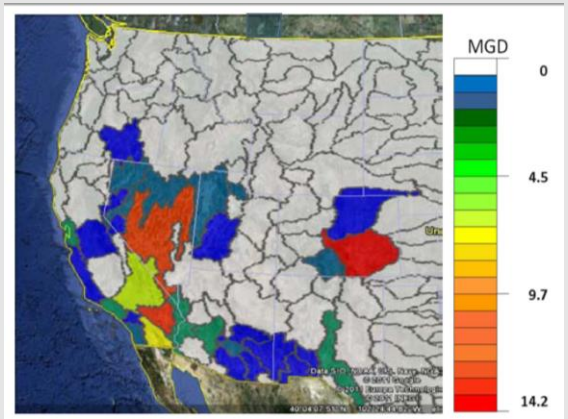
Project Benefits

- Position policy makers and resource managers to be proactive on future issues regarding water availability and energy development
- Integrate water supply into regional transmission planning in the West
- Develop regional data on water availability and water demand for energy.

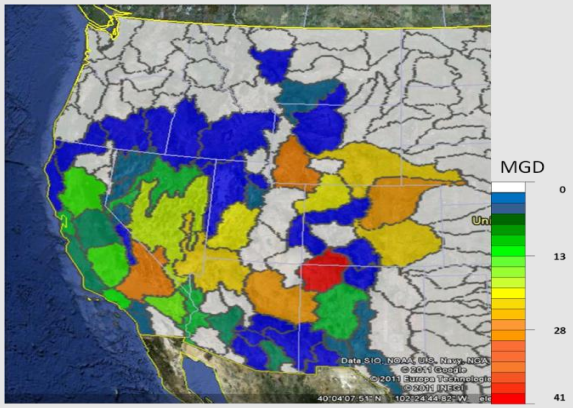
Project is funded by DOE and is being conducted in conjunction with the Western Electricity Coordinating Council (WECC).

WECC 10-Yr Plan
Energy-Water Results

1. Thermoelectric generation will drive a significant increase in water consumption by 2020;
2. Thermoelectric water demands are a significant driver of *new demands* for water and their spatial and temporal distribution can be critical;
3. Study cases do perform differently with respect to water withdrawal and consumption, suggesting technological or management fixes.



New Power Plant Consumption in Basins with a Low Ratio of Supply to Consumption.



New Power Plant Consumption in Basins at risk of Low Flow Events.

http://www.wecc.biz/library/StudyReport/Wiki%20Pages/Home.aspx

WGA Drought Study Request

Purpose: Assess how drought could affect thermoelectric cooling for the purpose of generation and transmission planning.

Status:

- National labs have completed a historic drought assessment.
- WGA, Labs, and WECC are executing the study.

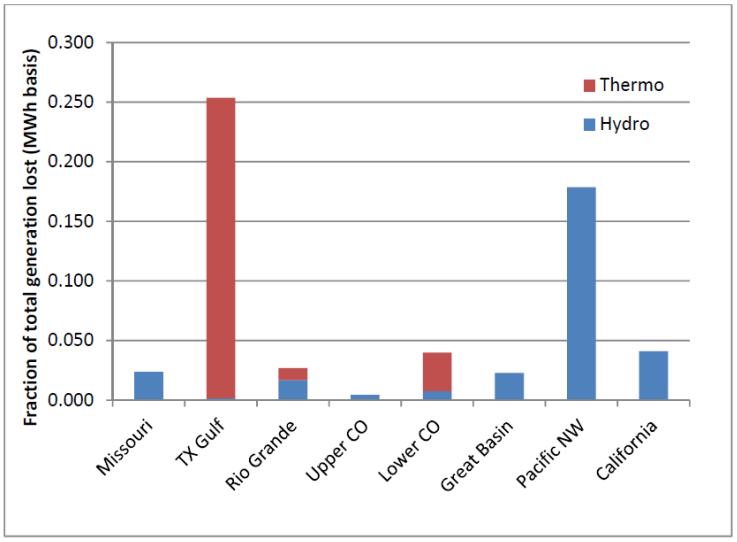


Figure 5.8 Fractional loss of total annual electricity generation for the 10th-percentile drought scenario.

Harto, et al, Argonne, 2011.

Next Steps: Analyze drought impacts to individual plants and run model in February 2012.

Why Should Tribal Leaders Care?

1. Water may be a critical and potentially limiting factor in electricity generation projects.
2. Water may be an asset for Tribes to partner in electricity generation projects.