

# Climate Change and BPA

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# The Climate Change Challenge

- Climate change is changing the business of electricity
- State and federal policies will likely continue to promote
  - increased energy efficiency
  - transmission infrastructure
  - cleaner transportation
  - new technologies
  - new renewable energy development
  - smart grid
  - large energy storage
- Important Effects on BPA
  - Hydrology (hydro generation) and Pacific Northwest loads
  - Costs and market prices
  - Integration of renewable resources

## Physical Effects of Climate Change in the Northwest

From Global Climate Change Impacts in the U.S. released by the White House, 4 major effects in the NW:

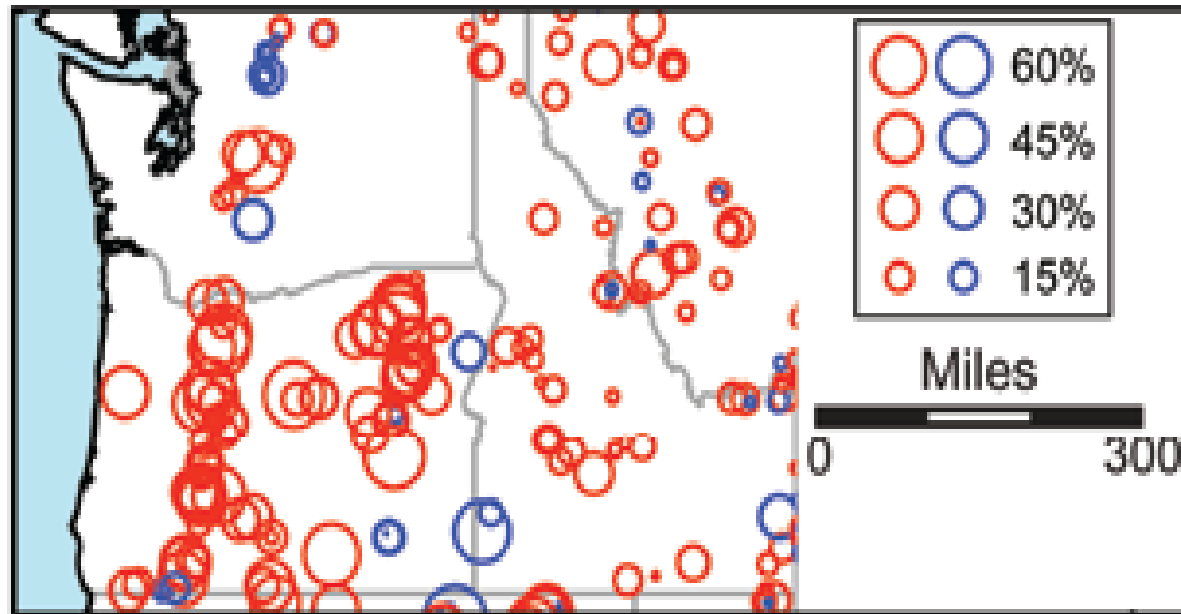
- Reduced summer streamflows
- Forest issues: wildfires and insect outbreaks
- Stress to salmon and coldwater species
- Sea level rise along vulnerable coasts

# Climate Change Impacts on Northwest Hydrology

In the future, warmer temperatures would result in more winter precipitation falling as rain rather than snow throughout much of the PNW. This change would result in:

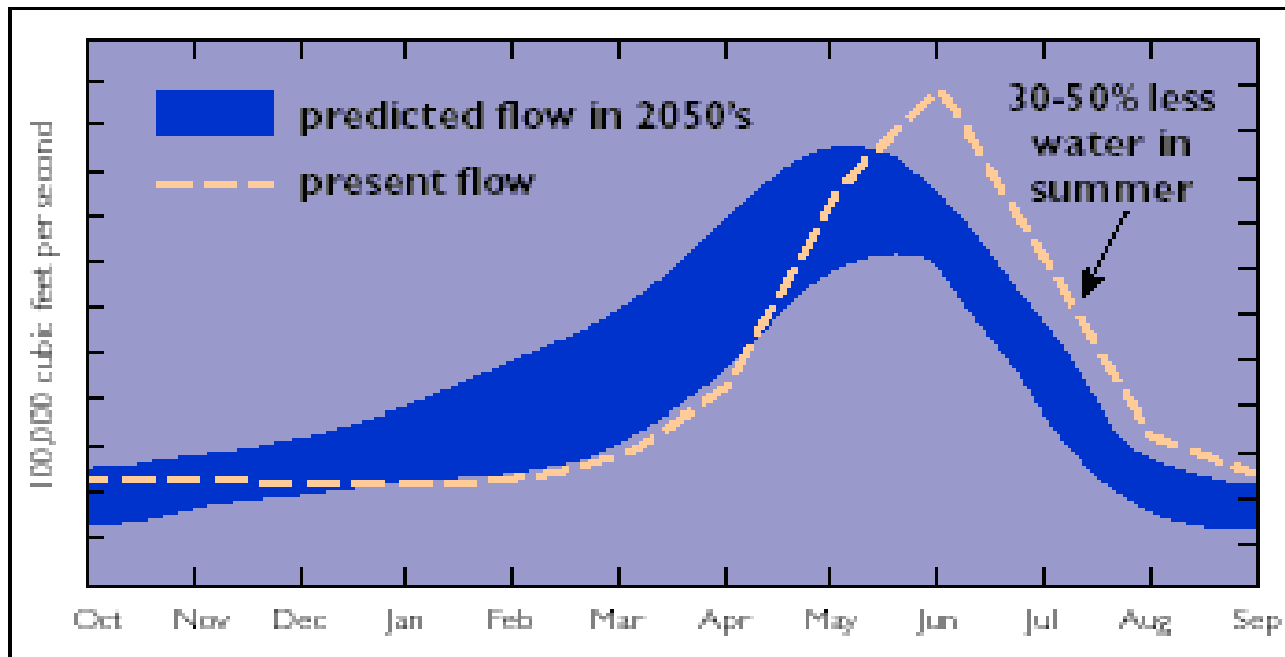
- less winter snow accumulation,
- higher winter streamflows,
- earlier spring snowmelt,
- earlier peak spring streamflow, and
- lower summer streamflows

# Decreasing April 1 Snowpack 1950-2002



**April 1 snowpack (a key indicator of natural water storage available for the warm season) has declined throughout the Northwest. In the Cascade Mountains, April 1 snowpack declined by an average of 25 percent, with some areas experiencing up to 60 percent declines.**

## Predicted Long-Term Climate Change Impact on Columbia River Streamflows



From Climate Change Impacts Group, <http://cses.washington.edu/cig/pnwc/pnwwater.shtml>

# Challenges for Providing Energy in the Year 2020

- Regional hydropower production is projected to decrease by 9-11% in summer in the 2020s
- NW population will increase and air conditioning market penetration will increase accordingly
- The combination of higher population and air conditioning penetration is projected to increase cooling energy demand by 165% to 201%
- Carbon will likely carry a price which will raise the market price of electricity