Northwest Power and Conservation Council

August 12, 2010

MEMORANDUM

TO: Power Committee

FROM: John Fazio, Senior Systems Analyst

SUBJECT: Briefing on River Management Joint Operating Committee (RMJOC) Climate Change Analyses

In 2009, the three federal action agencies (BPA, Corps and Bureau of Reclamation), under the auspices of the RMJOC, initiated a 2-year project to investigate potential climate change impacts to the Federal Columbia River Power Supply. The objective of this project is to collect and review scientific data pertaining to potential climate-related temperature, precipitation and stream flow changes, which could affect both power production and fish and wildlife populations in the Northwest. The end product of this work will be a common set of climate-change data that can be used for both power system and fish & wildlife analyses. This data along with federal analyses of potential impacts will be publicly available through an internet web site.

Council staff has participated in this project, as directed by two action items in the current power plan:

- Action item MON-4 directs the Council to continue to monitor progress in climate change models and their assessments of impacts on temperature, precipitation and stream flows.
- Action item F&W-5 directs the Council to work with federal agencies, the University of Washington's Climate Impacts Group, and others to examine the physical impacts of climate change to electricity demand, river flows, reservoir elevations, power production, and cost. It goes on to direct the Council to examine ways to mitigate these impacts and to encourage others to improve runoff volume forecasting methods, especially for the fall.

The RMJOC started with temperature, precipitation and stream flow data provided by the Climate Impacts Group for a multitude of different Global Climate Model analyses. From this data, a set of 9 scenarios were selected to reflect the full range of potential changes to temperature and precipitation for the 2025 and 2045 time periods. Forecasted temperature data is used by the Council to estimate potential changes to annual, monthly and hourly loads. Precipitation changes are used to develop climate-adjusted stream flow records for our models. Corresponding climate-adjusted flood control and operating rule curves will be provided by the federal agencies. The entire data set is projected to be completed by fall of 2010.

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The Council will use this data to assess potential impacts of climate change on power supply adequacy and on long-term resource acquisition strategy. It will also study potential changes to river flows, reservoir elevations and refill probabilities, which could affect fish and wildlife survival. As called for in action item F&W-5, the Council will also explore ways to modify the operation of the hydroelectric system to mitigate against potential negative impacts to both power and fish and wildlife.

Columbia River Management Joint Operating Committee (RMJOC)

Climate Change Studies Work Plan

August 12, 2010
Power Committee Conference Call

Outline

- What is RMJOC?
- Why are we involved?
- What products will it produce?
- When will initial studies be completed?
- How will we use these initial results?

What is RMJOC?

- The River Management Joint Operating Committee is made up of members from three federal action agencies
  - Bonneville Power
  - Corps of Engineers
  - Bureau of Reclamation
- Among other duties, this committee is tasked with assessing the impacts of climate change on the FCRPS
  - Collecting available scientific data
  - Developing methods to use this data for hydro analysis

Applications for RMJOC Work

- 2014/2024 Columbia River Treaty Review
- FCRPS Bi-Op assessments
- ESA/NEPA
- Reliability/Adequacy Studies
- Council's Power Plan
- Council's Fish and Wildlife Program
- Flood Risk Management
- Rates/Revenues
- Infrastructure Studies

Why are we involved?

- **MON-4: Monitor climate change policies and analysis**
  - Continue to monitor progress in climate change models and their assessments of impacts on temperature, precipitation and stream flows.
  - As the need arises, analyze specific climate change scenarios and assess potential effects on the plan's resource strategy.

- **F&W-5: Climate Change**
  - The Council will work with federal agencies, the University of Washington's Climate Impacts Group, and others to examine the physical impacts of climate change to electricity demand, river flows, reservoir elevations, power production, and cost.
  - The Council will examine ways to mitigate these impacts and encourage others to improve runoff volume forecasting methods, especially for the fall.
  - The Council will also work to develop methods that include the potential physical impacts of climate change into its resource planning methodology.

What will it produce?

- A publicly available set of climate change data for the Pacific Northwest region
- Analyses pertaining to the operation of the Columbia River hydroelectric system
- A web site that describes this work and provides public access to the data and related analyses

Data to be provided:

- Climate Impacts Group (University of Washington)
  - Daily weather inputs for hydrologic modeling
  - Daily hydrologic modeling results
  - Daily temperature change forecast
  - Climate adjusted modified stream flow record
- RMJOC Agencies
  - Climate adjusted seasonal runoff volume forecasts
  - Corresponding flood control rule curves
  - Corresponding operating rule curves

When will initial studies be completed?

- Began in 2009, examining data for the 2025 and 2045 time periods
- Started with 40 scenarios
- Narrowed down to 9 scenarios
- Temperature and raw stream flow data is available now
- Flood control and operating rule curve data should be available by early fall
- Initial federal analysis of this data should be available by late fall

How will we use the results?

- Power Planning
  - Assess potential impacts to power supply adequacy
  - Assess potential effects on the Council's long-term resource strategy
- Fish and Wildlife
  - Assess potential impacts to river flows, reservoir elevations and refill
  - Evaluate potential changes in mainstem Columbia/Snake River water temperatures
  - Explore potential F & W mitigation operations for the hydroelectric system