Northwest Power & Conservation Council
Climate & Weather Advisory Committee
December 4, 2024

Christian Douglass, NWPCC, began the meeting at 10:00 am by greeting the room and calling for introductions.

Justin Sharp, EPRI, noted that current weather data sets are not robust enough for wind power analysis and asked the body for help acquiring wind power data sets in an effort to validate existing synthetic data sets. Sharp asked that interested parties contact him.

Chad Madron, NWPCC, explained the best way to interact with the Zoom Webinar Platform.

Rick Williams, PSU, voiced concern over using the Portland Airport as a temperature indicator [Slide 18] as the area represents a microclimate that is moderated by the Columbia. He said the rest of Oregon could be much warmer or colder. Daniel Hua, NWPCC, said that this is used for convenience and the load forecast in the upcoming Plan will use 26 different regional temperatures.

Williams was concerned that this method often excludes major weather events which he hoped could be avoided. Douglass added that there are many different weather locations used in different parts of the modeling, and this represents a specific study. Tomás Morrissey, NWPCC, stated that, for load forecasting, association matters more than absolute temperature pointing to the importance of the connection between historical loads and historical temperatures.

Sanjeev Joshi, Critfc, commented that his organization talked about statically using river temperatures instead of air temperatures in four cities. He said there is a great model that takes satellite data and river temperature that could be used in the future.

Hua said this presentation uses four cities to analyze the difference between historical and future time. He assured the room that the model will use 25 different temperatures for the next Plan. Hua said they are limited to using air temperature because that is what is produced by the climate models.

Ronda Strauch, SCL, wrote, Just an added thought, the >=3 days may become a safety issue for some customers (as said), but reliability can also decline - such as transformers inability to cool off, in the question pane.

Mike Hamilton, SCL, wrote, Are we concerned that the future (modeled) heat waves do not reach the historical temp reached in 2021? In the question pane [Slide Heat-Wave Event Daily Maximum Temperatures]. Hua said that will be covered in the next slide.

Casey Burleyson, PNNL, wrote, What extreme events are you removing from your historical or projected data by imposing the >=3-day criteria? The most extreme events that could cause resource adequacy concerns may only last a day or two, in the question pane. Hua said that will also be covered.

Burleyson wrote, Could it matter that the highest historical temperature for GEG, PDX, and SEA occurred during the same event (2021) but in the projected data the highest temperatures for all four cities occur in different events? in the question pane [Slide 23]. Hua said he had not considered that, adding that three of the four happened during the 2021 heat dome.

Burleyson said he was concerned with not capturing region wide events, wondering if the stresses look different for system-wide versus local events. Hua pointed to A 2041 July and August to illustrate a good population for extreme high temps.

Strauch wrote, This should matter…a regional event is more challenging to deal with than different days and places.

Hamilton wrote Thanks Dan. Still wonder if we are being too conservative with the temps for SEA and PDX if we already reached these temps in 2021 and there are a lot of future years left for us to get higher!

Hua countered that there are a lot of 100°+F Seattle events on the chart, saying that should be enough. Hamilton said that [Slide 24] shows a climate scenario that is 4-5°F higher than historical for Boise and Spokane but the same as historical for Seattle and Portland. He thought there should be an event with a few extra degrees to just be sure. Hua said they will stay with the RMJOC data but offered to talk more offline.

Sharp replied to Hamilton that most research is pointing to the 2021 heat dome as a major outlier. He said it might happen again but didn't think the approach was overly conservative.

Jennifer Light, NWPCC, called this the heart of the discussion, saying the next Plan wants to look closely at extremes. She said there is a question of if we need an additional scenario to capture further extremes or if this extreme weather scenario captures it deeply enough. Light said this discussion is useful as staff think it through.

Sharp added that the internal variability of the climate system on top of climate change impacts created the 2021 event. He said it wasn't clear if the antecedent conditions that created the events are becoming more common.

Williams wrote, Will the study consider other population centers with microclimates for correlation such as Hood River, Medford/Ashland, Bend, Baker in Oregon? in the question pane. He then asked, given that the Council is considering extreme events, will the Plan encourage other studies to consider them as well. He noted that the grid transmission study from a year ago didn't include it in their charter.

Morrissey said there are 26 cities in the wider study but not Hood River specifically. Williams said maybe some climate experts can look at the data sets and see if they are missing an obvious and repeating situation. Morrissey offered to look at the finished load forecast compared to historic and compare magnitudes.

Hua was not sure if the Council would encourage other entities to look into extreme events. Light said staff have 1.5 years to get out a written draft of the Plan, so a lot is up in the air. She said incorporating the climate change data into the 2021 Plan was a big step forward. Light said the core part of the Plan is to put forward resource recommendations for BPA and everything else is to be determined.

Sharp wrote, I'll be opinionated. The G2048 temperatures just don't seem credible to me. To get -15 into Portland is almost impossible. These look like a manifestation of the low resolution of the climate models if I understand the origins of the future data correctly. in the question pane.

Sharp expanded on his comment saying his work on northwest weather shows there really isn't a path for weather that cold to come into the Willamette valley and the Puget Sound areas. He added that the arctic source for that cold weather is also warming. Sharp agreed that there is an opposite climate change argument that posits that a higher amplitude jet stream could bring colder air more quickly and intensely into the region which makes it more difficult to predict Boise and Spokane weather but countered that even those areas have geographical limitations that climate models cannot account for.

Hua asked specifically about the -28°F for Boise and the -27°F for Spokane. Sharp did not have a strong opinion about those cities but said they didn't seem exceptionally unrealistic. Sharp said the -4°F for Seattle did seem unlikely but not impossible.

Burleyson wrote, The 2048 event is definitely very cold. But if you're willing to base your heat wave projections on climate models (with known biases) then you should be willing to base your cold snap projections on the same models. The 2021 heat wave was a +4 sigma event that some people thought impossible. Maybe we just haven't experienced a -4 sigma event yet. in the questions pane.

Nathalie Voisin, PNNL, asked for the definition of a cold snap [Slide Frequency of Cold-Snap Events Per Decade] Hua moved to [Slide 27] for the definition.

Douglass asked the room for more comments about the presented data sets representing extreme events well enough.

Brunkhorst wondered if staff could consider a more statistical approach for extreme events. He didn't have a specific approach in mind but wondered if there was some established statistical method that could simplify the process, pointing to an EPA approach. Hua recalled Burleyson's earlier +4 sigma comment saying it could be looked into.

Burleyson said that statistics are not his expertise, but the standard deviation is commonly used. Hua offered to explore further offline.

Verene Martin, SCL, supported a statistical method to define a cold snap, saying it would be helpful to make it city specific as a cold snap of lower than 15°F in Seattle is unlikely. Hua said that could be done but added that historically Seattle has reached 0°F. He suggested emailing comments for further discussion.

Modeling Solar Generation
With Annika Roberts, NWPCC and Dor Hirsh Bar Gai, NWPCC

Guillaume Mauger, UW, wrote, The comparison between TMY and CNRM is striking for how different it is. I'm not sure it's reasonable to assume that radiation from CNRM is more likely to be correct for the future than just assuming a constant TMY going into the future. in the question pane [Slide 56]. Hua said that will be discussed in an upcoming slide.

Sharp wrote, I agree wholeheartedly and was thinking the same. in the question pane in regard to [Slide Comparison of Hourly Solar Capacity Factors: SAM's TMY output Solar C.F. and TSL Solar CF].

Hua asked for opinions on [Slide Comparison of Hourly Solar Capacity Factors by Month: SAM's Aggregated CC output and TSL Solar CF].

Mauger pointed to the challenge clouds present to climate models, saying the 35-40% difference between TMY and CNRM points to model bias in cloudiness.

Sharp agreed, pointing to the impact of climate change on cloud cover as a reason that the models are all over the place. He said a researcher he works with on this finds basically no signal. Because of this, Sharp thought it would be safer to assume no change. He qualified that this doesn't mean nothing will change but there is no knowledge available yet.

Mauger wrote for the solar CFs during heat waves, do you see any effect in the historical record? I would think that would be a better indication than using the future projections. [Slide CCSM4 Climate Scenario CFs for Days around a Regional Heat-Wave]. Hua said we could look at the synthetic data or solar irradiance data and offered to take a look.

Mike Hamilton, SCL, wrote, Are impacts of wildfire smoke/haze material enough to consider? in the question pane. Sharp thought that would possibly be the largest risk from a resource adequacy point of view for solar and thought it would be valuable to explore this. Hamilton then wrote, Perhaps they are captured by the variability already present in these distributions.

Hua said there are plans for a wildfire scenario. Light agreed, saying there will be more to come.

Strauch wrote, I'm leaning to using the historical for this time around and perhaps see how the models improve over time for the next plan. She also wrote, Also, manufactures of solar panels could have data and thoughts on performance under extreme temperatures [Slide 80].

Ted Light, Lighthouse Energy, said there are effects and panels have a temperature coefficient. Hua said that could be investigated.

Hua ended the meeting at 12:00pm.

Attendees via Zoom Webinar

Christian Douglass	NWPCC	Sanjeev Joshi	Critfc
Daniel Hua	NWPCC	David Graves	Critfc
Jennifer Light	NWPCC	Guillaume Mauger	UW
Justin Sharp	Epri	Ronda Strauch	SCL
Chad Madron	NWPCC	Samuel Justice	MC Power
Mike Hamilton	SCL	Rick Williams	PSU
Casey Burleyson	PNNL	Verene Martin	SCL
Ruizhe Wang	SCL	Dor Hirsh Bar Gai	NWPCC
Mary Kulas	Nuclear	Annika Roberts	NWPCC
Byron Harmon	WA UTC	Tomás Morrissey	NWPCC
Allison Jacobs	PSE	Cindy Strecker	CLEAResult
Aaron Orlowski	EWEB	Amber Riter	PGE
Zeecha Van Hoose	Clark PUD	Greg Brunkhorst	Tacoma Power
Massoud Jourabchi	Greenway Research	Brian Dekiep	NWPCC
Cindy Wright	SCL	Erik Pytlak	BPA
Mike Hermanson	Avista	Ted Light	Lighthouse Energy
Wesley Franks	WA UTC	Sophia Spencer	Nauvoo Solutions
Heather Nicholson	Orcas Power & Light	Fred Heutte	NW Energy Coalition
Craig Patterson	independent	Nathalie Voisin	PNNL