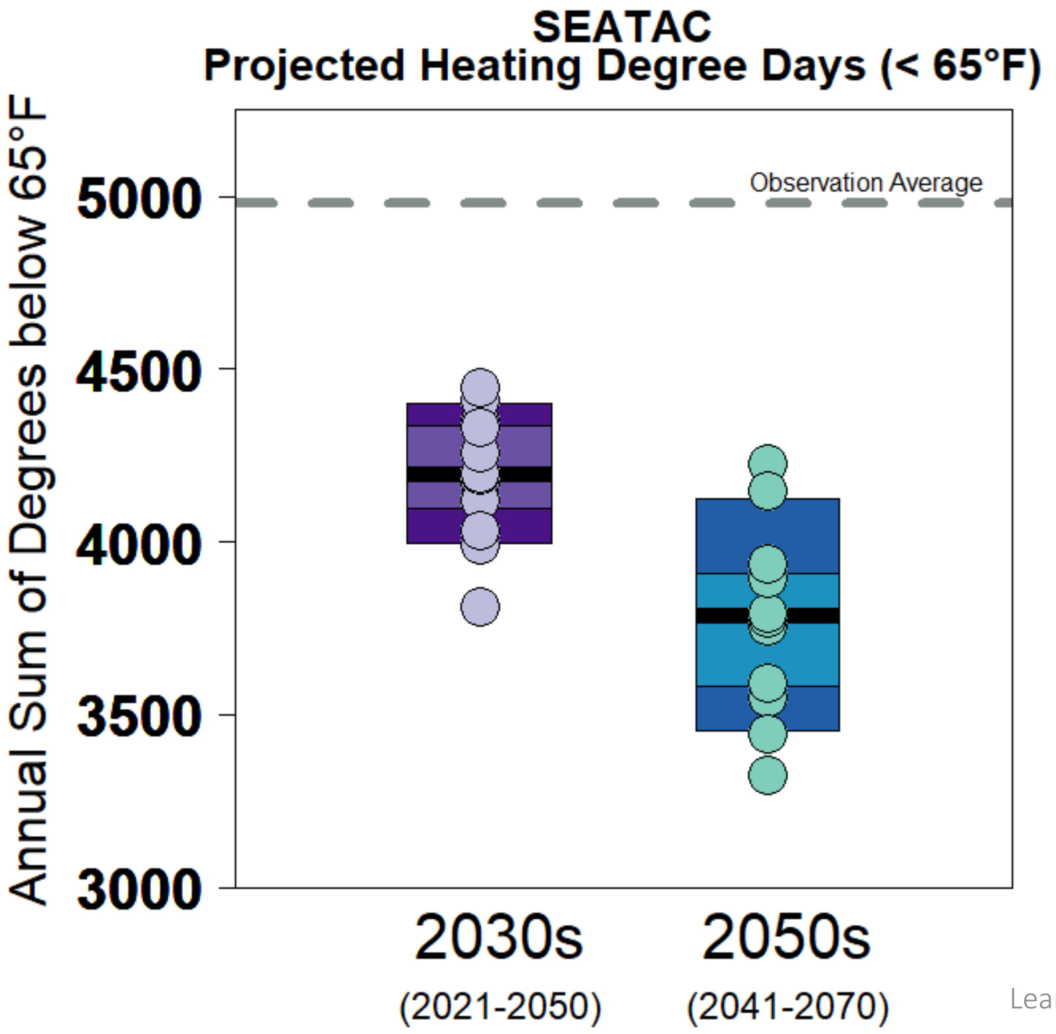
HEATING DEGREE DAYS | SeaTac

Annual sum of degrees below a base temperature of 65°F (units: °F-days), as measured by the daily mean temperature.



Years	Median	Range
Observations	4982 °F-days	N/A
2030s	4195°F-days	3813 to 4447°F-days
2050s	3782°F-days	3323 to 4225°F-days

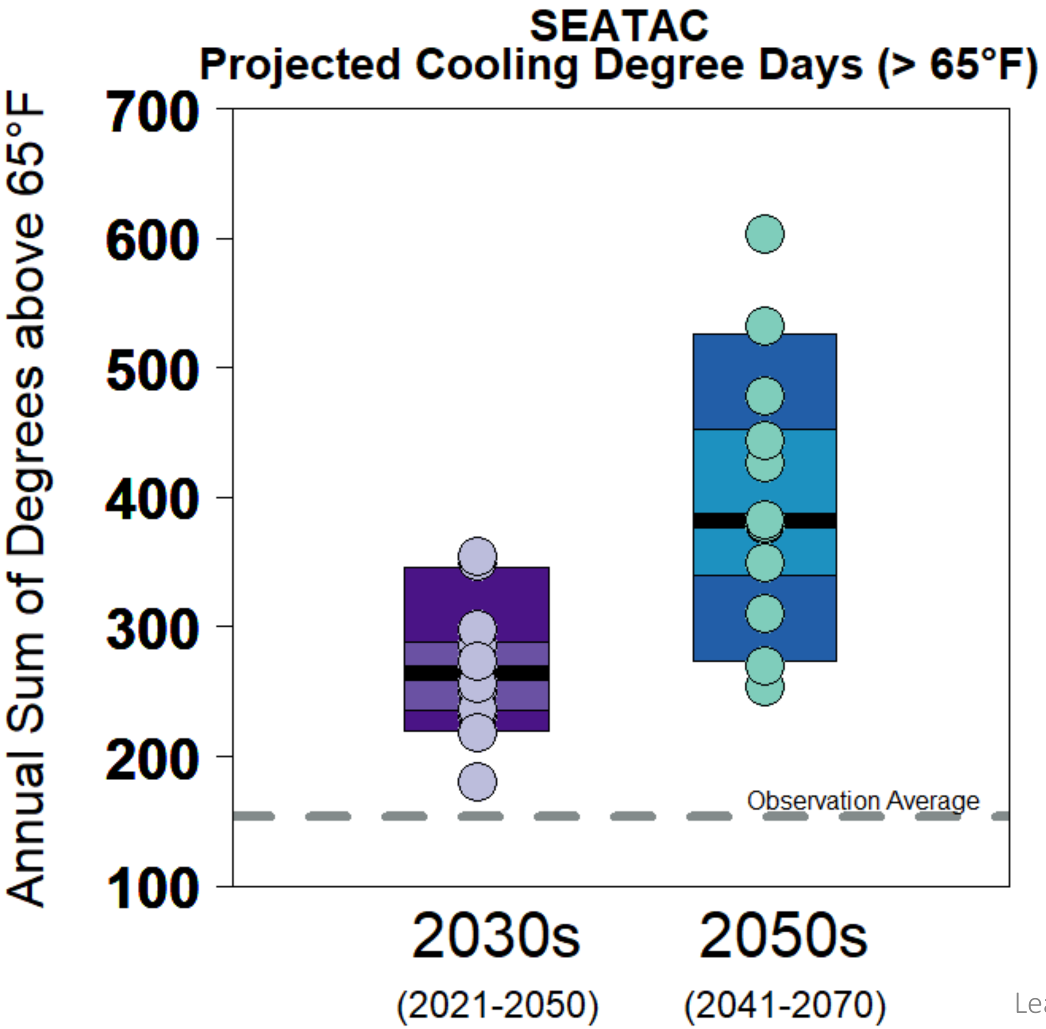
Why does this matter? A change in annual heating degree days is relevant for assessing change in average electricity demand in winter for use in load forecasting.

- For the 2030s and 2050s, all models project a decrease in heating degree days (HDD).
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the difference between modeled historical (1981-2010) HDD and projected HDD for the 2030s and 2050s, then adding that difference to the observed HDD from the SeaTac record (4982 °F-days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 model projections.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

COOLING DEGREE DAYS | SeaTac

Annual sum of degrees above a base temperature of 65°F (units: °F-days), as measured by the daily mean temperature.



Years	Median	Range
Observations	154°F-days	N/A
2030s	265°F-days	181 to 355°F-days
2050s	382°F-days	254 to 603°F-days

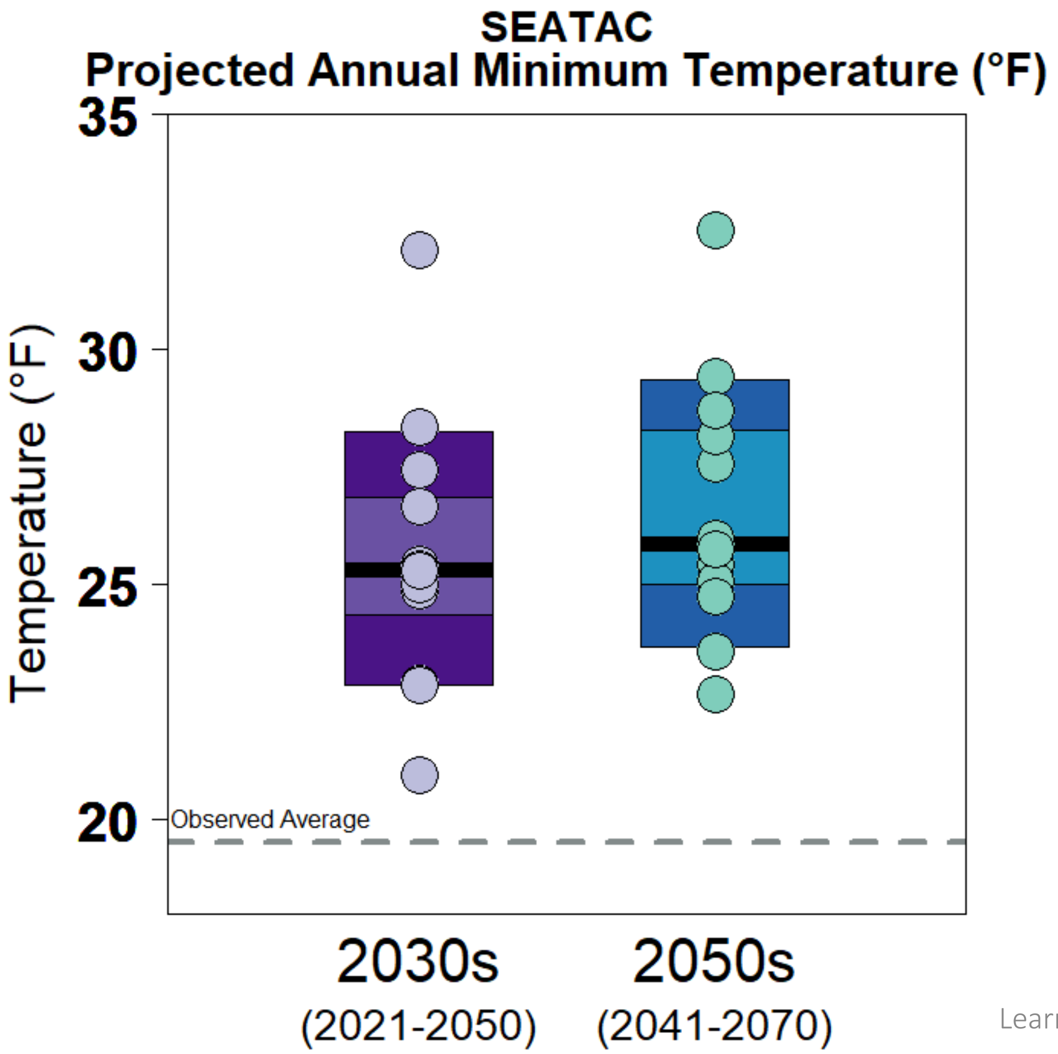
Why does this matter? A change in annual cooling degree days is relevant for assessing change in average electricity demand in summer and for use in load forecasting.

- For the 2030s and 2050s, all models project an increase in cooling degree days (CDD).
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the difference between modeled historical (1981-2010) CDD and projected CDD for the 2030s and 2050s, then adding that difference to the observed CDD from the SeaTac record (154 °F-days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

ANNUAL MINIMUM TEMP. | SeaTac

Minimum hourly temperature for the calendar year.



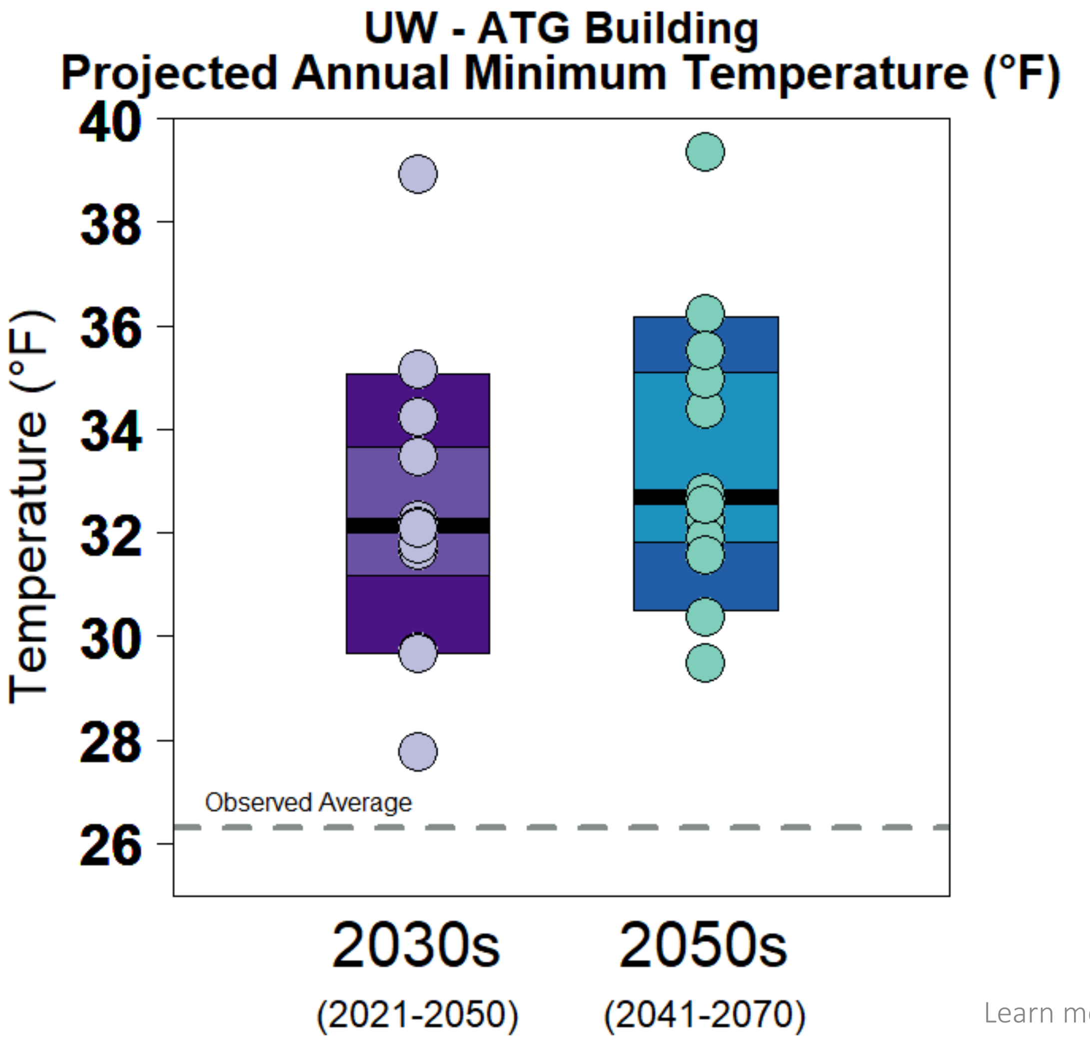
Years	Median	Range
Observations	19.5°F	N/A
2030s	25.3 °F	20.9 to 32.1°F
2050s	25.8 °F	22.7 to 32.5°F

Why does this matter? - A change in the annual minimum temperatures is relevant for peak electricity demand and equipment standards.

- For the 2030s and 2050s, all regional climate models project an increase in annual minimum temperature.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the difference between modeled historical (1981-2010) annual minimum temperature and projected annual minimum temperature for the 2030s and 2050s, then added that difference to the observed average annual minimum temperature from the SeaTac record (19.5°F, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

ANNUAL MINIMUM TEMP. | UW ATG

Minimum hourly temperature for the calendar year.



Years	Median	Range
Observations	26.3°F	N/A
2030s	32.1 °F	27.8°F to 38.9°F
2050s	32.7 °F	29.5°F to 39.4°F

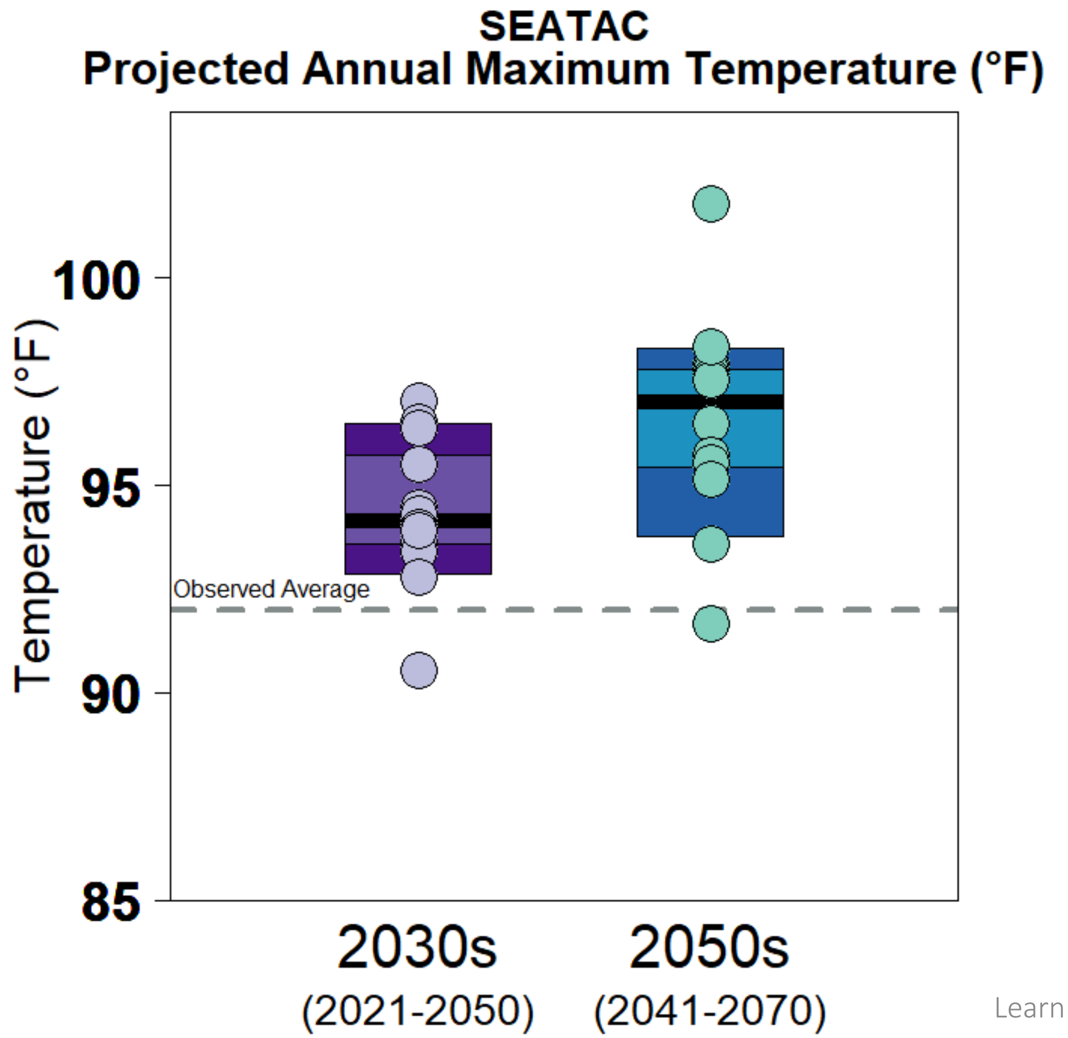
Why does this matter? A change in the annual minimum temperatures is relevant for peak electricity demand and equipment standards.

- For the 2030s and 2050s, all regional climate models project an increase in annual minimum temperature.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the difference between modeled historical (1981-2010) annual minimum temperature and projected annual minimum temperature for the 2030s and 2050s, then added that difference to the observed average annual minimum temperature from the UW ATG Building record (26.3°F, 1999-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

ANNUAL MAXIMUM TEMP. | SeaTac

Maximum hourly temperature for the calendar year.



Years	Median	Range
Observations	92.0°F	N/A
2030s	94.1 °F	90.5 to +97.0 °F
2050s	97.0 °F	91.7 to 101.8 °F

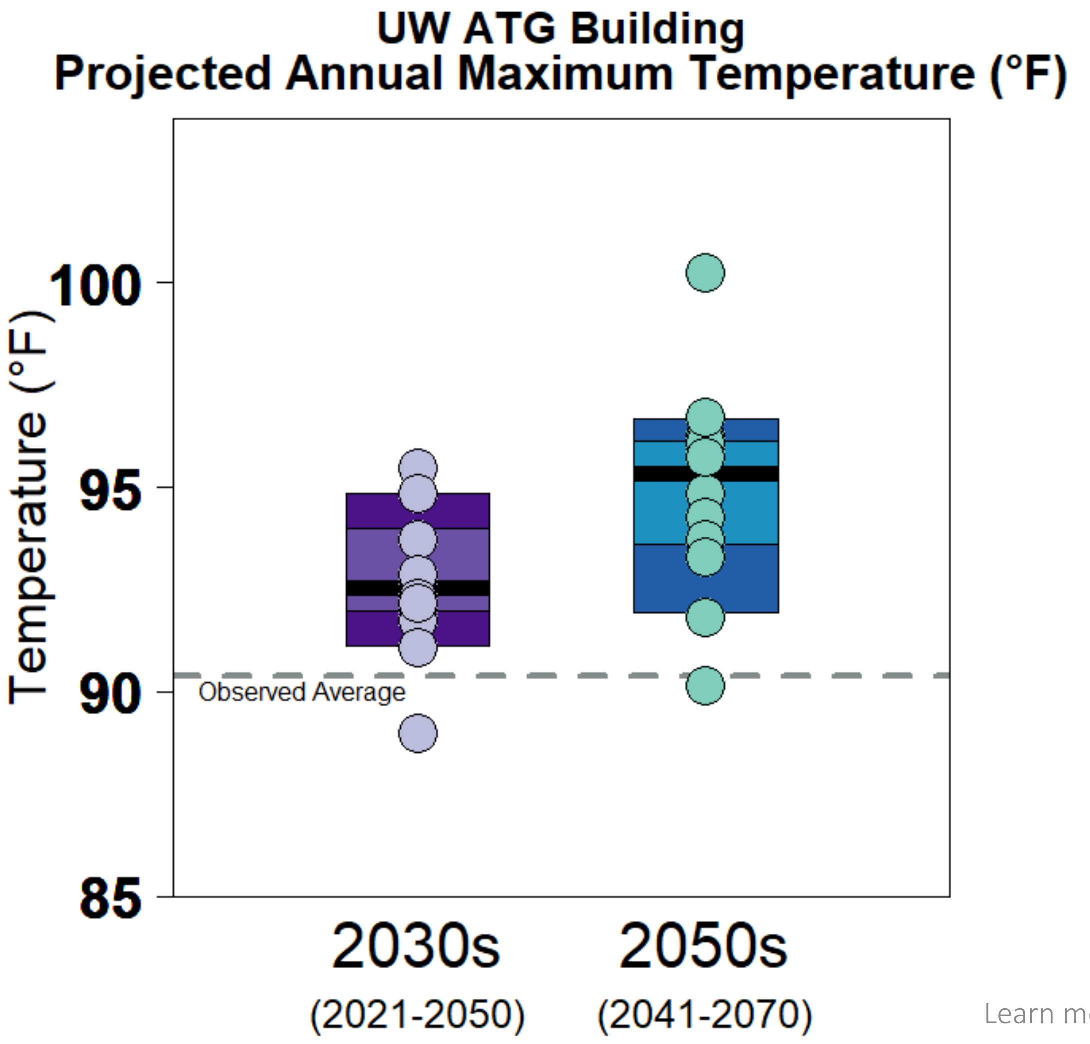
Why does this matter? A change in the annual maximum temperatures is relevant for peak electricity demand and equipment performance and standards.

- For the 2030s and 2050s, most regional climate models project an increase in annual maximum temperature.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the difference between modeled historical (1981-2010) annual maximum temperature and projected annual maximum temperature for the 2030s and 2050s, then added that difference to the observed average annual maximum temperature from the SeaTac record (92.0°F, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

ANNUAL MAXIMUM TEMP. | UW ATG

Maximum hourly temperature for the calendar year.



Years	Median	Range
Observations	90.4°F	N/A
2030s	92.5 °F	89.0°F to 95.6°F
2050s	95.3°F	90.1 to +100.2°F

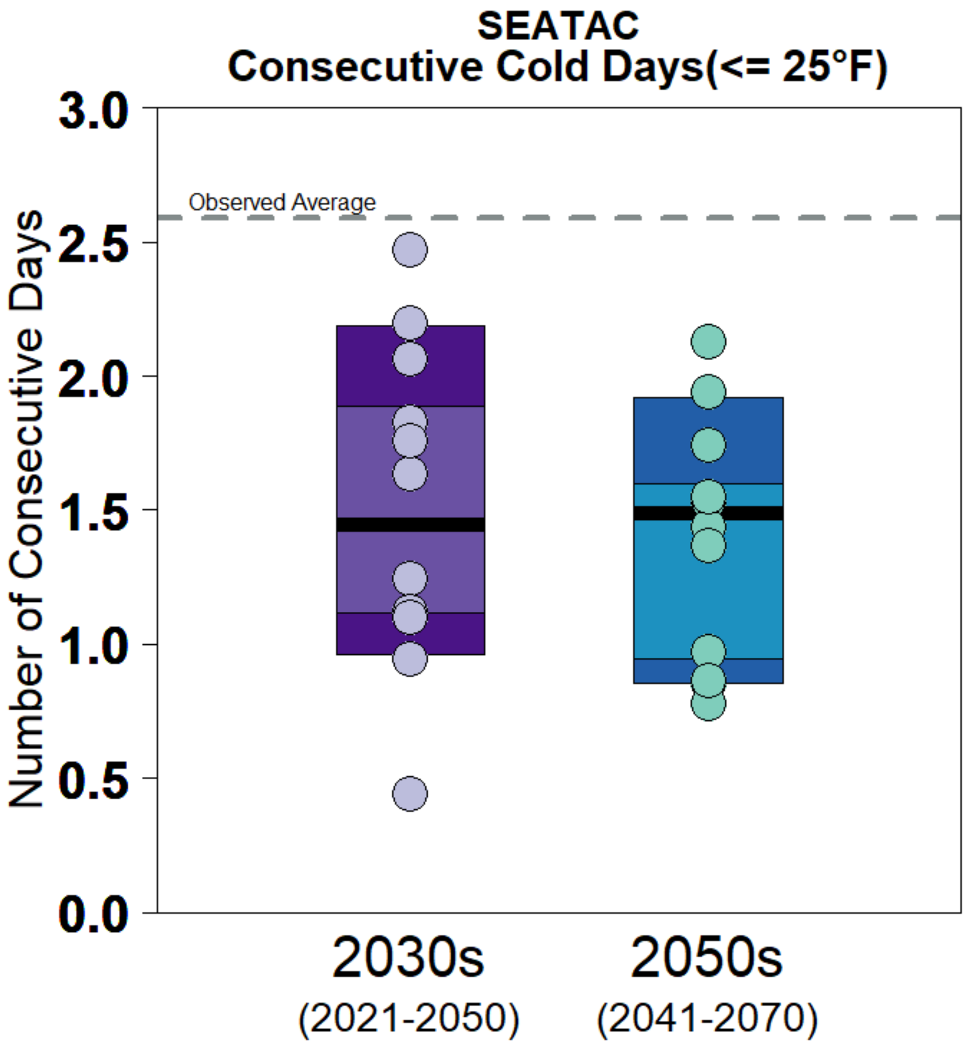
Why does this matter? A change in the annual maximum temperatures is relevant for electricity demand and equipment performance and standards.

- For the 2030s and 2050s, most regional climate models project an increase in annual maximum temperature.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the difference between modeled historical (1981-2010) annual maximum temperature and projected annual maximum temperature for the 2030s and 2050s, then added that difference to the observed average annual maximum temperature from the UW ATG Building record (90.4°F, 1999-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

CONSECUTIVE COLD DAYS | SeaTac

Longest consecutive days stretch with minimum temperatures at or below 25°F.



Years	Median	Range
Observations	2.6 days	N/A
2030s	1.5 days	0.4 to 2.5 days
2050s	1.5 days	0.8 to 2.1 days

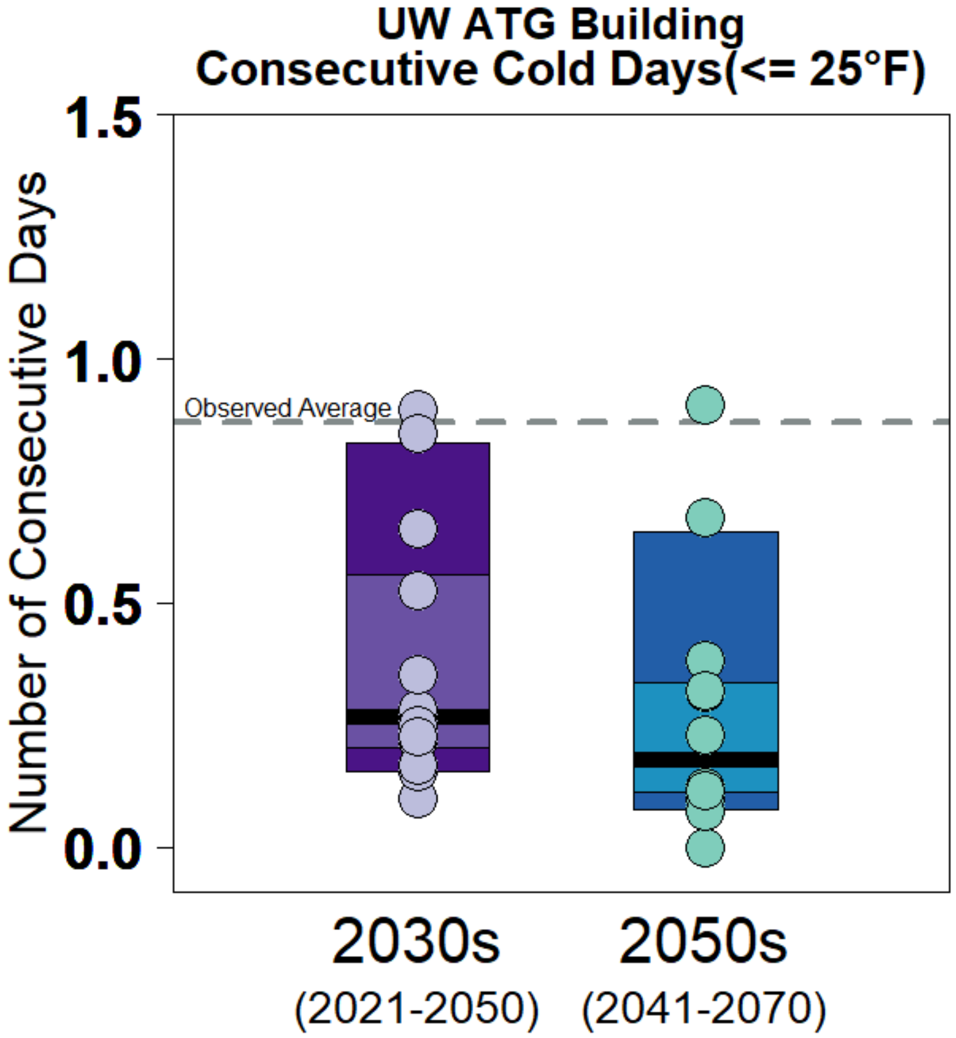
Why does this matter? - A change in the number of cold spells, consecutive days with extreme cold temperatures, is relevant for assessing peak electricity demand in winter for resource adequacy and for distribution system planning.

- For the 2030s and 2050s, all regional climate models project a decrease in the number of consecutive cold days.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) consecutive cold days (CDD) and projected CDD for the 2030s and 2050s, then added that difference to the observed CDD from the SeaTac record (2.6 days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

CONSECUTIVE COLD DAYS | UW ATG

Longest consecutive days stretch with minimum temperatures at or below 25°F.



Years	Median	Range
Observations	0.9 days	N/A
2030s	0.3 days	0.1 to 0.9 days
2050s	0.2 days	0 to 0.9 days

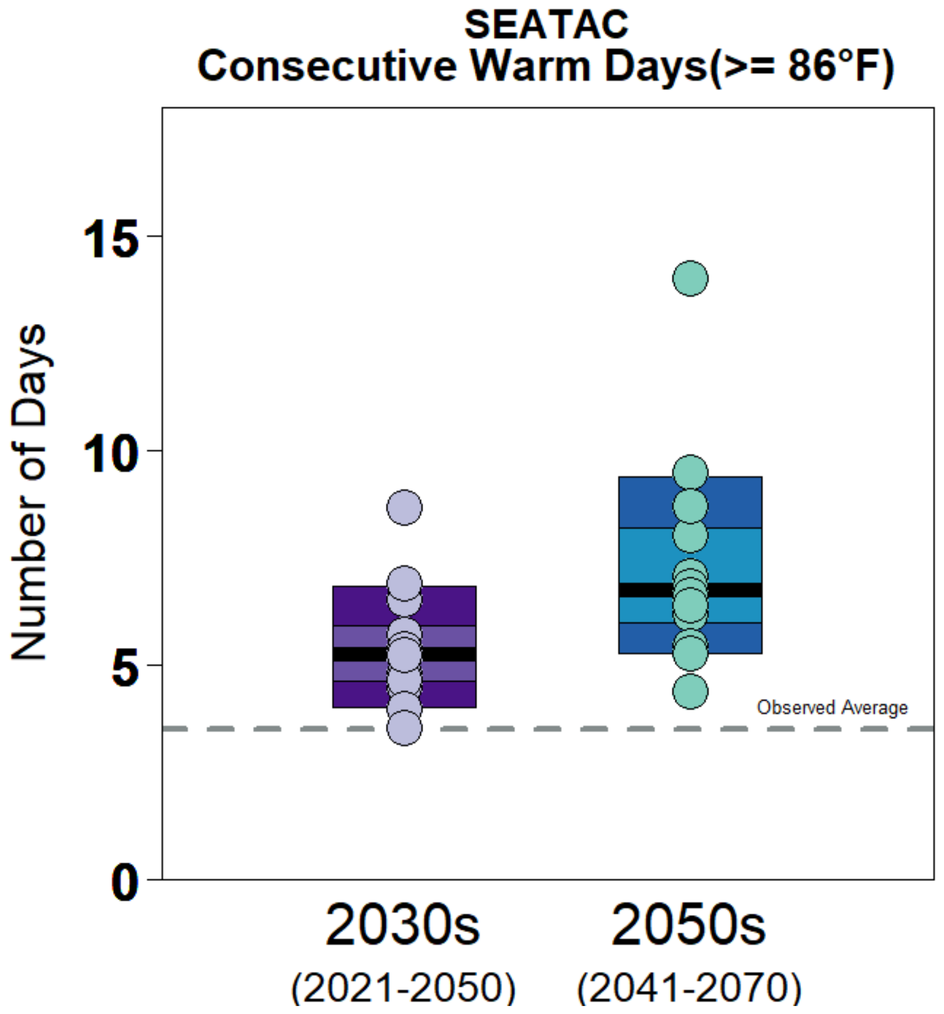
Why does this matter? - A change in the number of cold spells, consecutive days with extreme cold temperatures, is relevant for assessing peak electricity demand in winter for resource adequacy and for distribution system planning.

- For the 2030s and 2050s, most regional climate models project a decrease in the number of consecutive cold days.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) consecutive cold days (CDD) and projected CDD for the 2030s and 2050s, then added that difference to the observed CDD from the UW ATG Building record (0.9 days, 1999-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

CONSECUTIVE WARM DAYS | SeaTac

Longest consecutive days stretch with maximum temperatures at or above 85°F.



Years	Median	Range
Observations	3.5 days	N/A
2030s	5.2 days	3.5 to 8.7 days
2050s	6.7 days	4.4 to 14 days

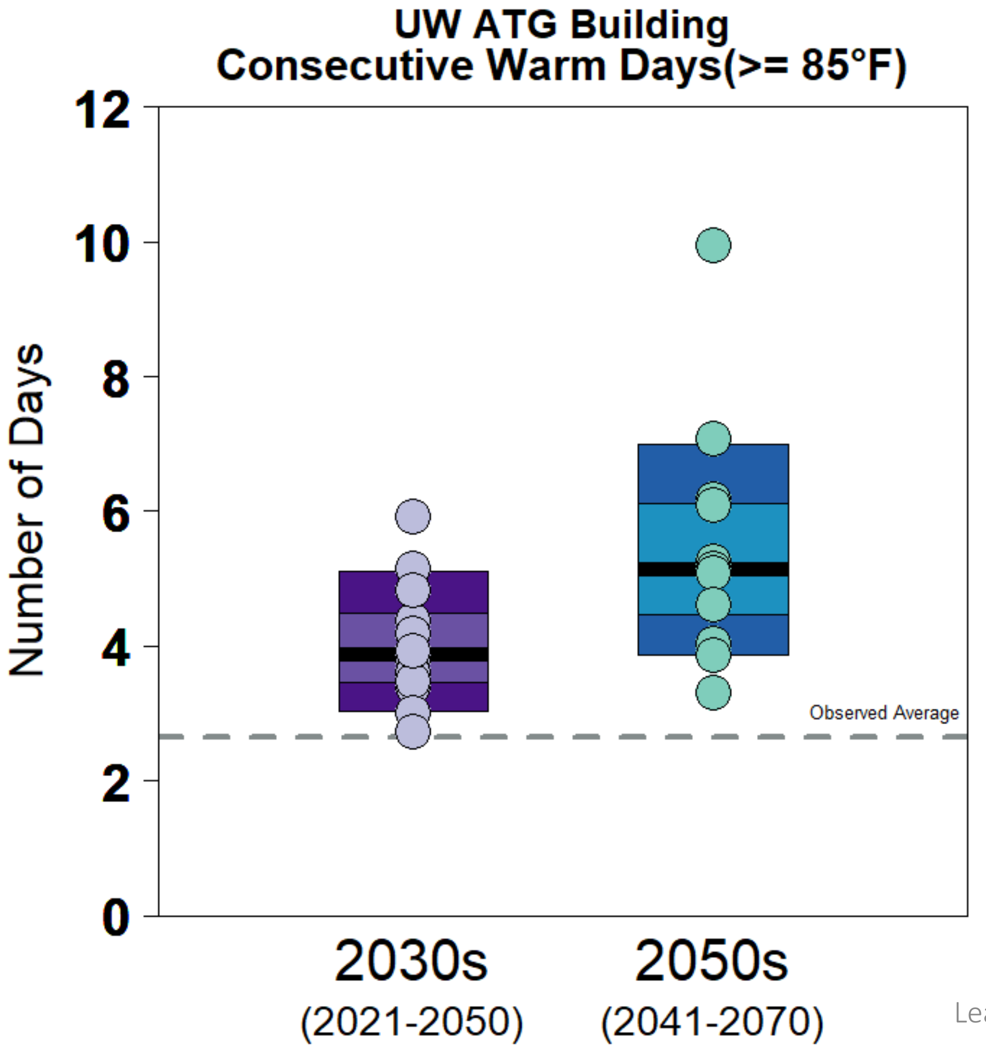
Why does this matter? - A change in the number of warm spells, consecutive days with extreme high temperatures, is relevant for assessing peak electricity demand in summer for resource adequacy and distribution system planning.

- For the 2030s and 2050s, most regional climate models project an increase in the number of consecutive warm days with maximum temperatures above 85°F.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) consecutive warm days (CWD) and projected CWD for the 2030s and 2050s, then added that difference to the observed CWD from the SeaTac record (3.5 days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

CONSECUTIVE WARM DAYS | UW ATG

Longest consecutive days stretch with minimum temperatures at or above 85 deg. F.



Years	Median	Range
Observations	2.5 days	N/A
2030s	3.8 days	2.4 to 5.8 days
2050s	4.8 days	2.8 to 9.9 days

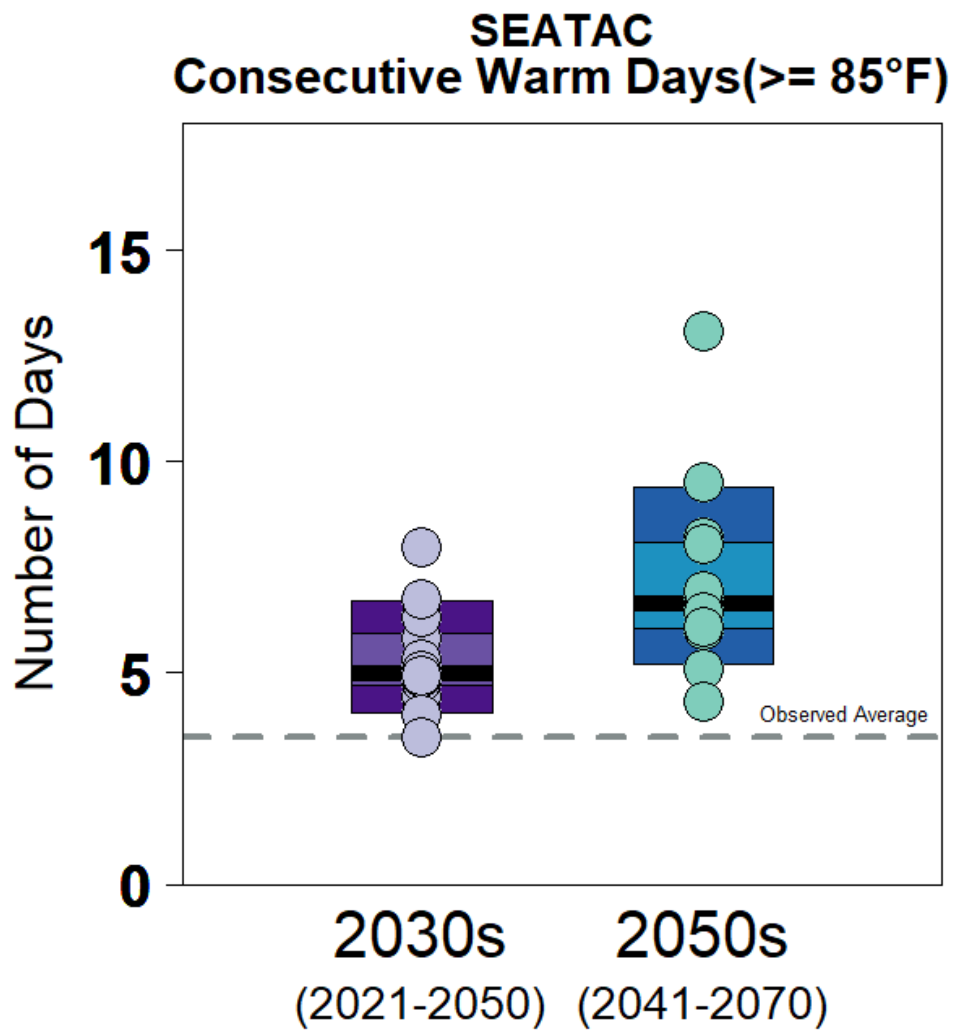
Why does this matter? - A change in the number of warm spells, consecutive days with extreme high temperatures, is relevant for assessing peak electricity demand in summer for resource adequacy and distribution system planning.

- For the 2030s and 2050s, most regional climate models project an increase in the number of consecutive warm days.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) consecutive warm days (CWD) and projected CWD for the 2030s and 2050s, then added that difference to the observed CWD from the UW ATG Building record (2.5 days, 1999-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

CONSECUTIVE WARM DAYS | SeaTac

Longest consecutive days stretch with minimum temperatures at or above 85°F.



Years	Median	Range
Observations	3.5 days	N/A
2030s	5.0 days	3.5 to 8.0 days
2050s	6.6 days	4.3 to 13.1 hours

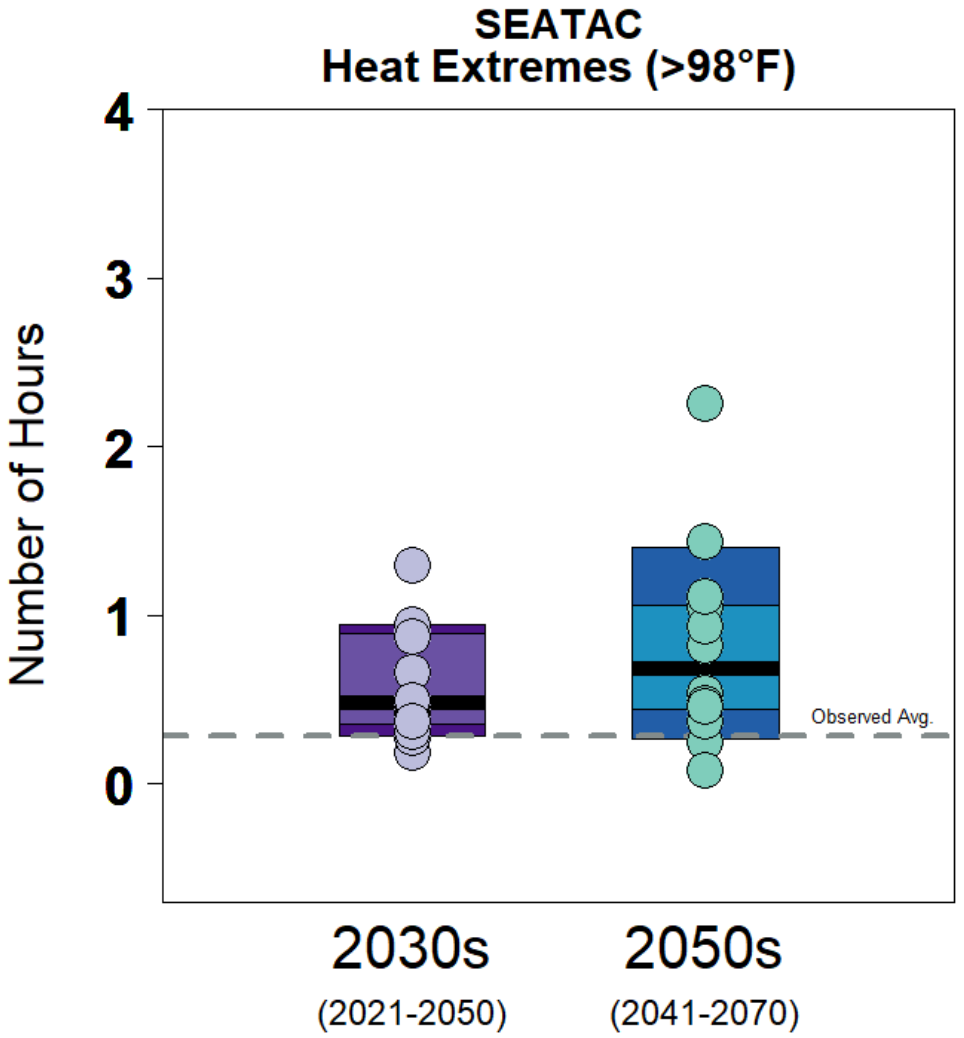
Why does this matter? A change in the number of warm spells, consecutive days with extreme high temperatures, is relevant for assessing peak electricity demand in summer for resource adequacy and distribution system planning.

- For the 2030s and 2050s, most regional climate models project an increase in the number of consecutive warm days (CWD).
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) CWD and projected CWD for the 2030s and 2050s, then added that difference to the observed CWD from the SeaTac record (3.5 days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

HEAT EXTREMES | SeaTac

Annual number of hours above 98°F.



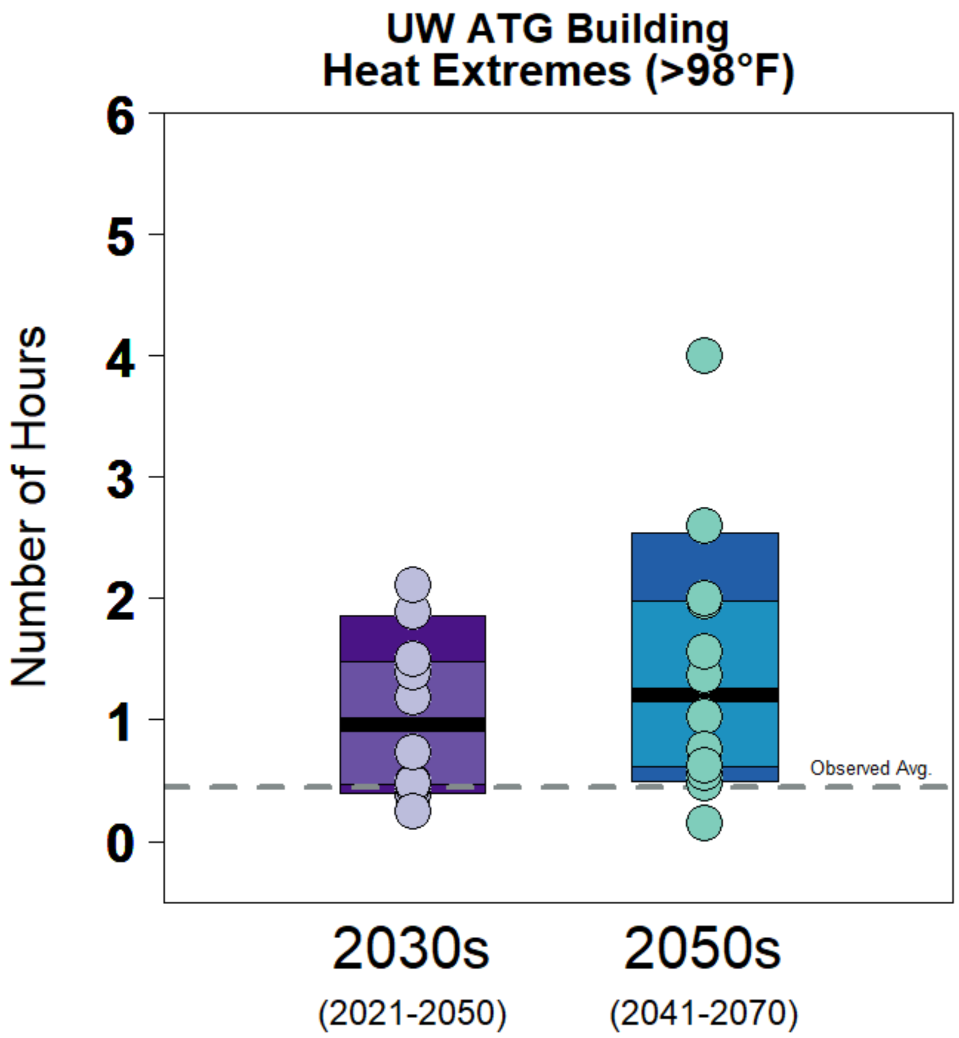
Years	Median	Range
Observations	0.3 hours	N/A
2030s	0.5 hours	0.2 to 1.3 hours
2050s	0.7 hours	0.1 to 2.3 hours

Why does this matter? A change in the amount of time that temperatures are above high extremes is relevant for assessing peak electricity demand in summer for resource adequacy and distribution system planning.

- For the 2030s and 2050s, most regional climate models project a slight increase in annual number of hours above 98°F.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) warm temperature extremes and projected warm temperature extremes for the 2030s and 2050s, then added that difference to the observed average from the SeaTac record (0.3 hours, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

HEAT EXTREMES | UW ATG

Annual number of hours above 98°F.



Years	Median	Range
Observations	0.5 hours	N/A
2030s	1.0 hours	0.3 to 2.1 hours
2050s	1.2 hours	0.2 to 4.0 hours

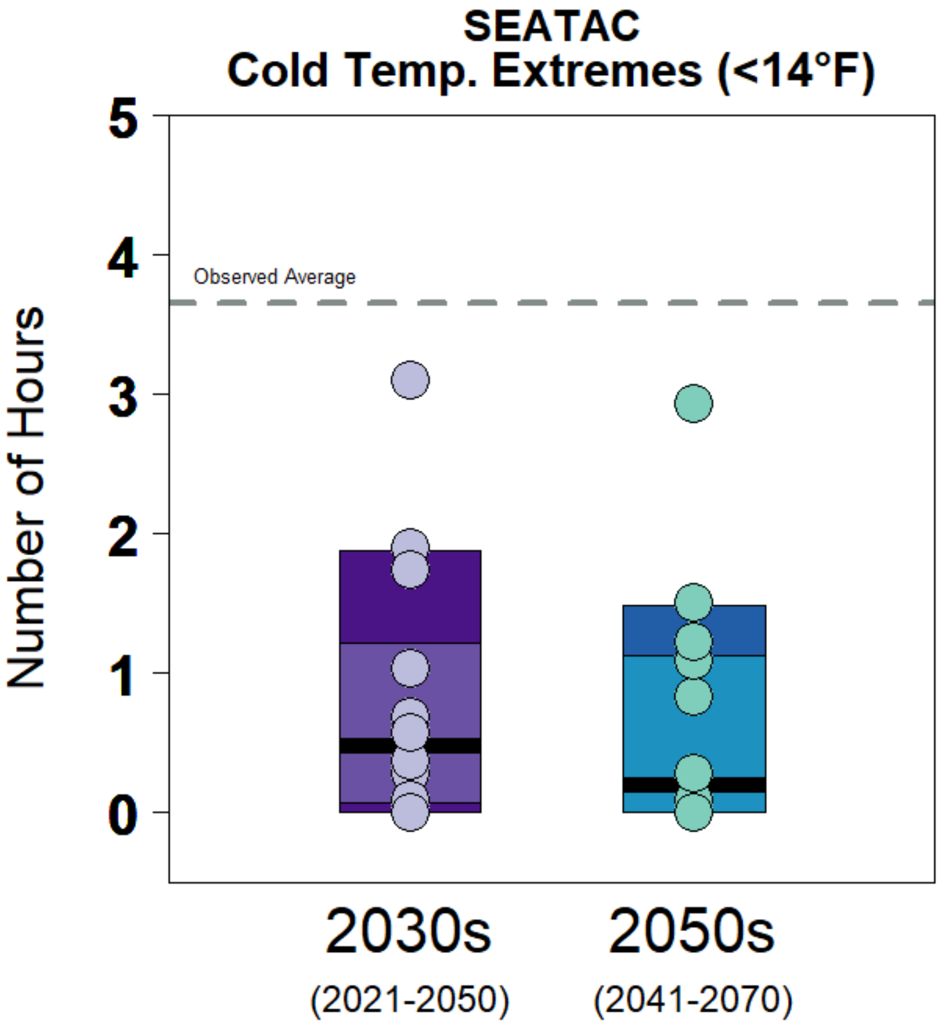
Why does this matter? - A change in the amount of time that temperatures are above high extremes is relevant for assessing peak electricity demand in summer for resource adequacy and distribution system planning.

- For the 2030s and 2050s, most regional climate models project a slight increase in annual number of hours above 98°F.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) warm temperature extremes and projected warm temperature extremes for the 2030s and 2050s, then added that difference to the observed average from the UW ATG building record (0.5 hours, 1999-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

COLD EXTREMES | SeaTac

Annual number of hours below 14°F.



Years	Median	Range
Observations	3.7 hours	N/A
2030s	0.5 hours	0 to 3.1 hours
2050s	0.2 hours	0 to 2.9 hours

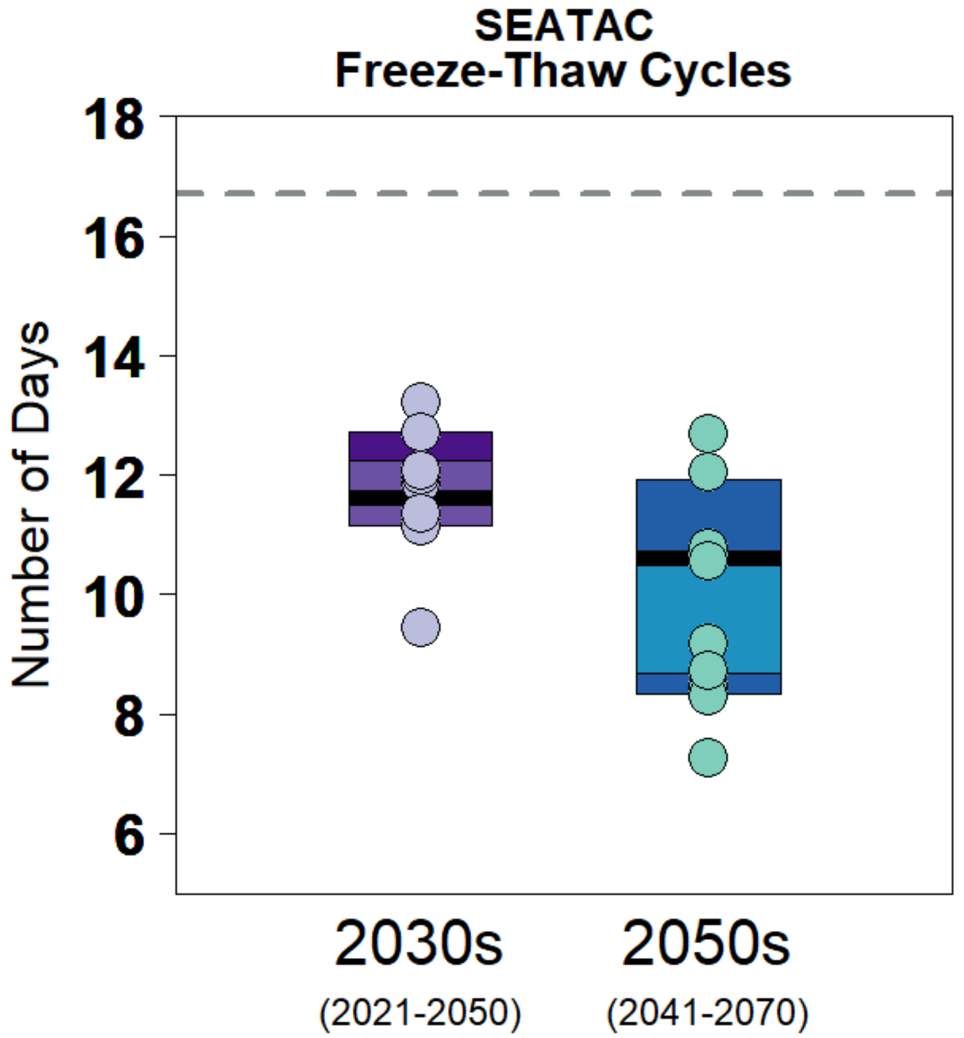
Why does this matter? A change in the amount of time that temperatures are below cold extremes is relevant for assessing peak electricity demand in winter for resource adequacy and for distribution system planning.

- For the 2030s and 2050s, all regional climate models project a decrease in the average annual number of hours below 14 deg F.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) cold temperature extremes and projected cold temperature extremes for the 2030s and 2050s, then added that difference to the observed average from the SeaTac building record (3.7 hours, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

FREEZE-THAW CYCLE | SeaTac

Annual number of days where daily minimum temperature is below 32°F and daily maximum temperature is above 32°F.



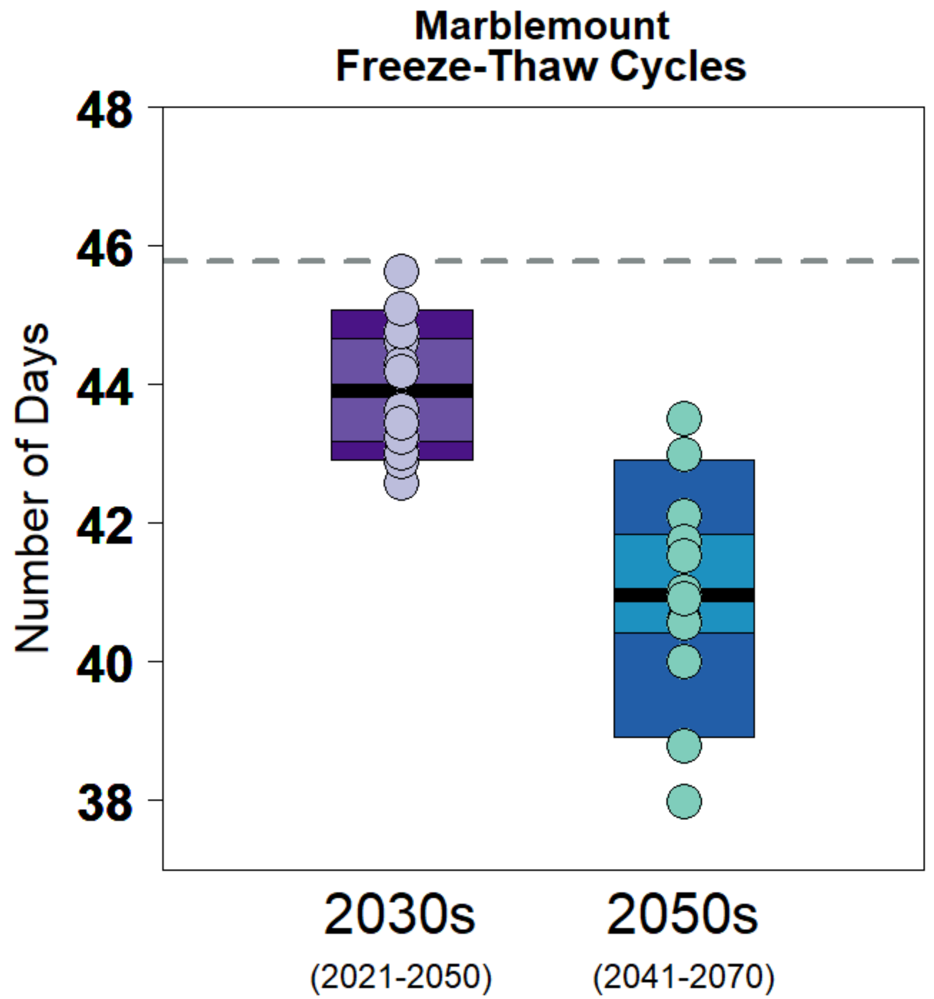
Years	Median	Range
Observations	16.7 days	N/A
2030s	11.6 days	9.5 to 13.2 hours
2050s	10.6 days	7.3 to 12.7 hours

Why does this matter? A change in the frequency of freeze-thaw cycles can affect equipment and contribute to rock fall and road damage that causes closures.

- For the 2030s and 2050s, all regional climate models project a decrease in the average number of freeze-thaw days per year.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) freeze-thaw cycles and projected freeze-thaw cycles for the 2030s and 2050s, then added that difference to the observed average from the SeaTac record (16.7 days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

FREEZE-THAW CYCLE | Marblemount

Annual number of days where daily minimum temperature is below 32°F and daily maximum temperature is above 32°F.



Years	Median	Range
Observations	45.8 days	N/A
2030s	43.9 days	42.6 to 45.6 hours
2050s	41.0 days	38 to 43.5 hours

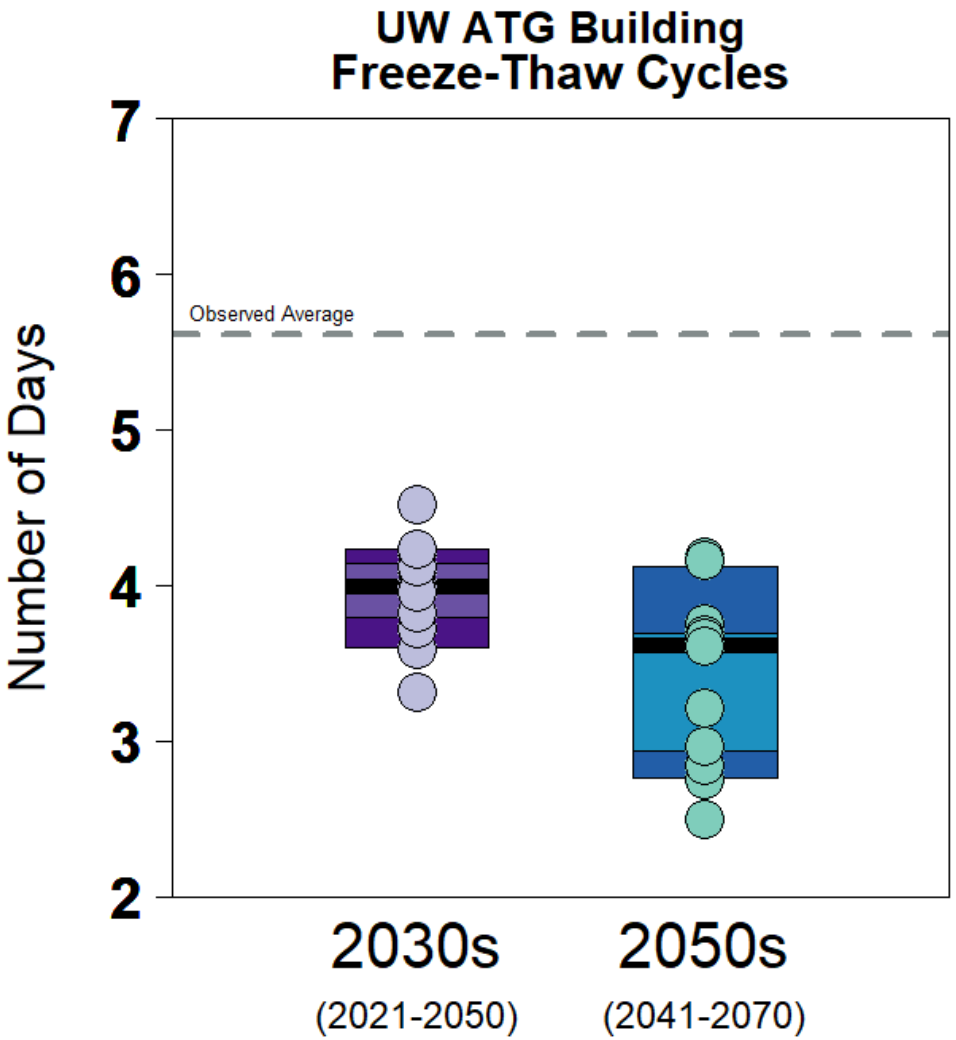
Why does this matter? A change in the frequency of freeze-thaw cycles can affect equipment and contribute to rock fall and road damage that causes closures.

- For the 2030s and 2050s, all regional climate models project a decrease in the average number of freeze-thaw days per year.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) freeze-thaw cycles and projected freeze-thaw cycles for the 2030s and 2050s, then added that difference to the observed average from the Marblemount record (45.8 days, 2003-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

FREEZE-THAW CYCLE | UW ATG Bld.

Annual number of days where daily minimum temperature is below 32°F and daily maximum temperature is above 32°F.



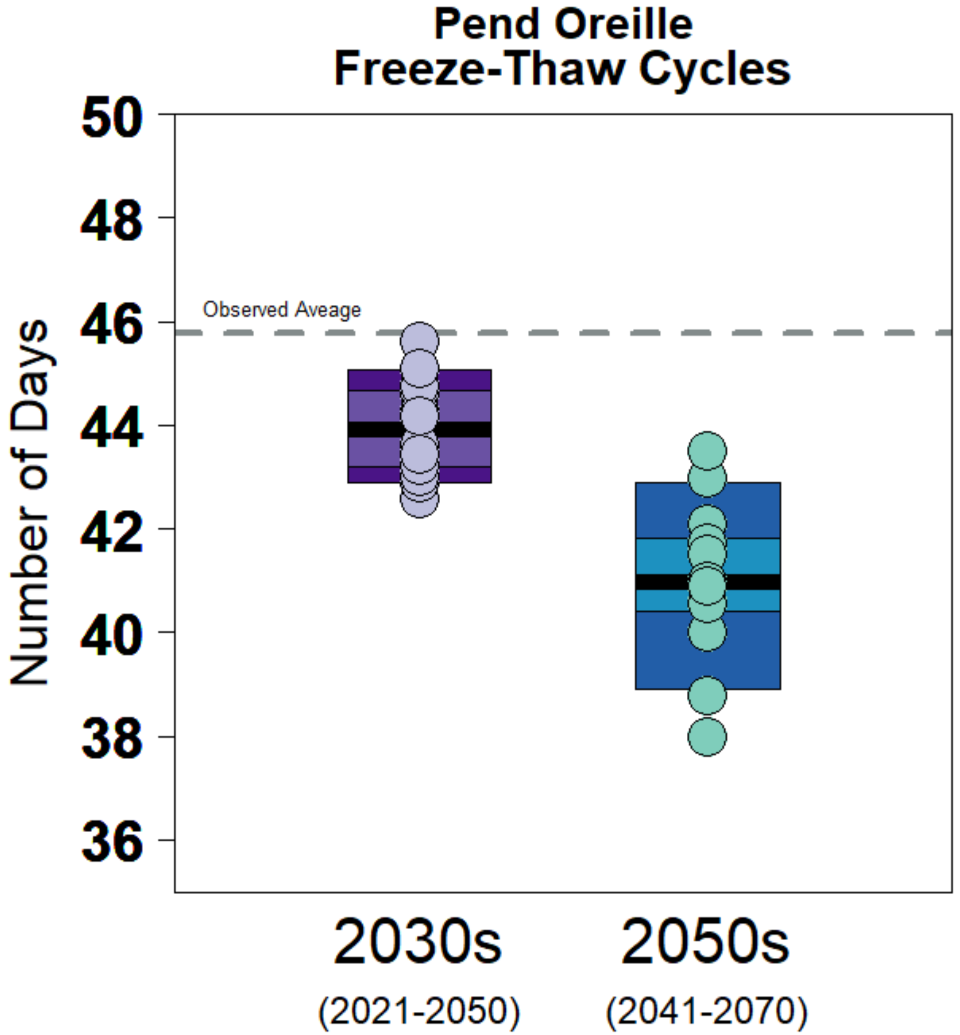
Years	Median	Range
Observations	5.6 days	N/A
2030s	4 days	3.3 days to 4.5 days
2050s	3.6 days	2.5 days to 4.2 hours

Why does this matter? A change in the frequency of freeze-thaw cycles can affect equipment and contribute to rock fall and road damage that causes closures.

- For the 2030s and 2050s, all regional climate models project a decrease in the average number of freeze-thaw days per year.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) freeze-thaw cycles and projected freeze-thaw cycles for the 2030s and 2050s, then added that difference to the observed average from the UW ATG building record (5.6 days, 1999-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

FREEZE-THAW CYCLE | Pend Oreille

Annual number of days where daily minimum temperature is below 32°F and daily maximum temperature is above 32°F.



Years	Median	Range
Observations	45.8 days	N/A
2030s	43.9 days	42.6 to 45.6 days
2050s	41.0 days	38.0 to 43.5 days

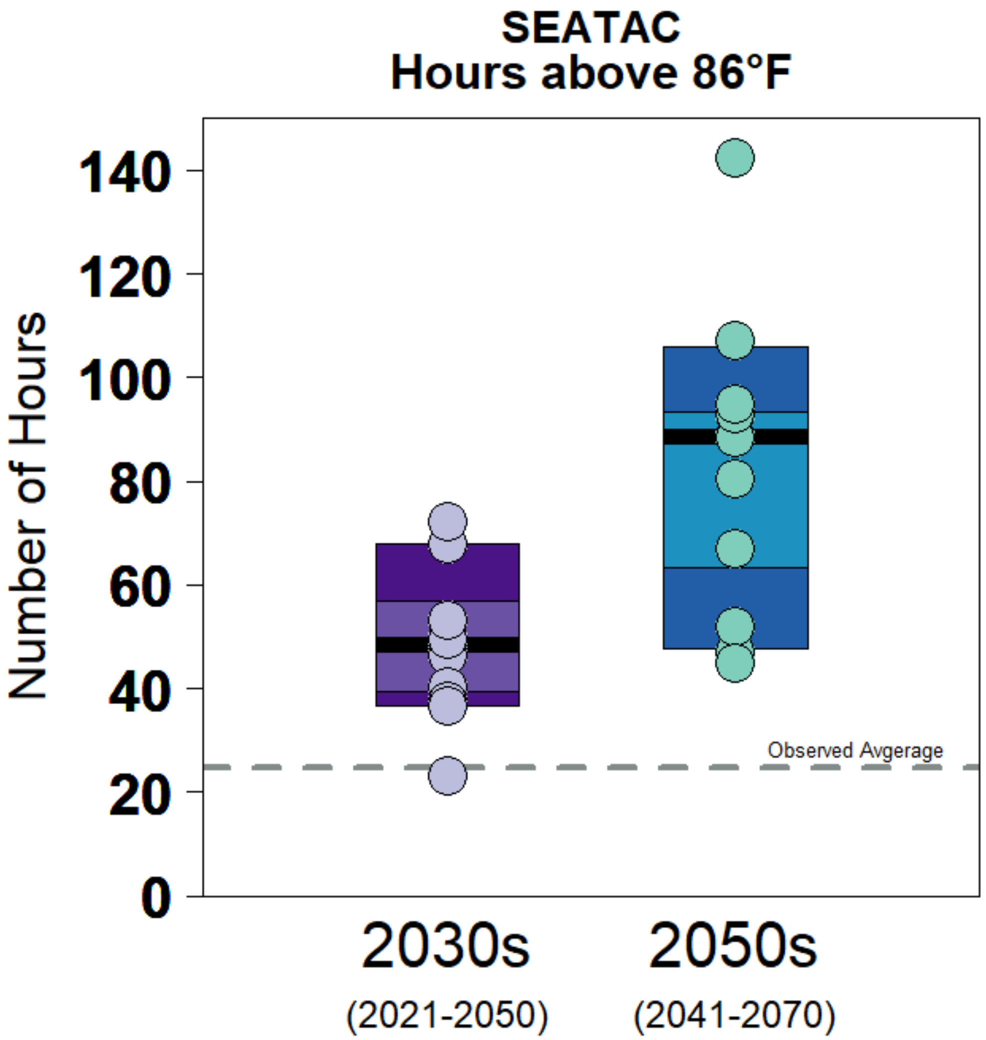
Why does this matter? A change in the frequency of freeze-thaw cycles can affect equipment and contribute to rock fall and road damage that causes closures.

- For the 2030s and 2050s, all regional climate models project a decrease in the average number of freeze-thaw days per year.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) freeze-thaw cycles and projected freeze-thaw cycles for the 2030s and 2050s, then added that difference to the observed average from the Pend Oreille record (45.8 days; 1990-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

HOURS ABOVE 86°F | SeaTac

Annual number of hours where temperatures exceed 86 °F.



Years	Median	Range
Observations	24.6 hours	N/A
2030s	48.3 hours	23.1 to 72.3 hours
2050s	88.5 hours	45.0 to 142.5 hours

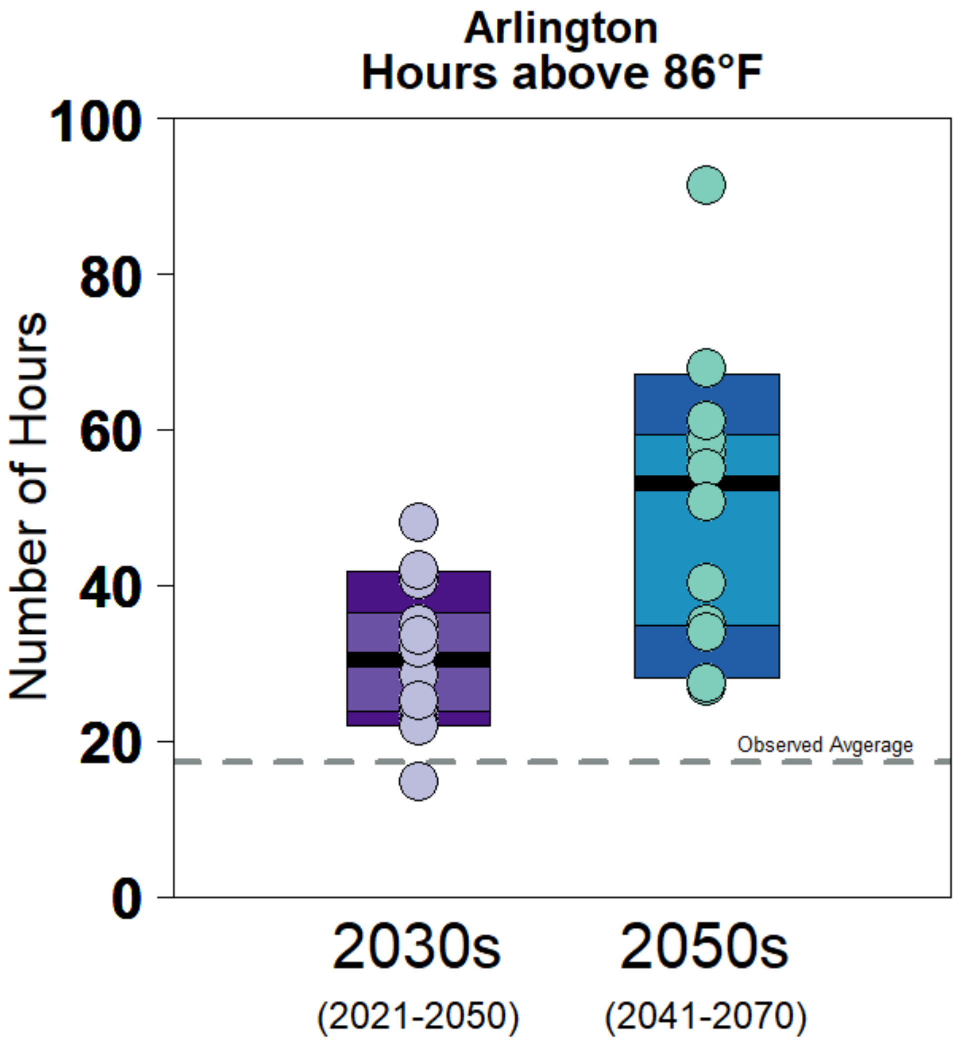
Why does this matter? A change in the number of hours with temperatures above this threshold can affect system capacity and is relevant for transmission system planning. *Winds are also important for cooling on hot days. However, winds are not projected to change drastically. Therefore, climate-related decisions for system capacity and/or transmission system planning should be based on projected changes in temperature.*

- For the 2030s and 2050s, most climate models project an increase in the average annual number of hours where temperatures exceed 86. deg. F.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then added that difference to the observed average from the SeaTac record (24.6 hours, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

HOURS ABOVE 86°F | Arlington

Annual number of hours where temperatures exceed 86°F.



Years	Median	Range
Observations	17.3 hours	N/A
2030s	30.3 hours	14.8 to 48.1 hours
2050s	53.0 hours	27.2 to 91.5 hours

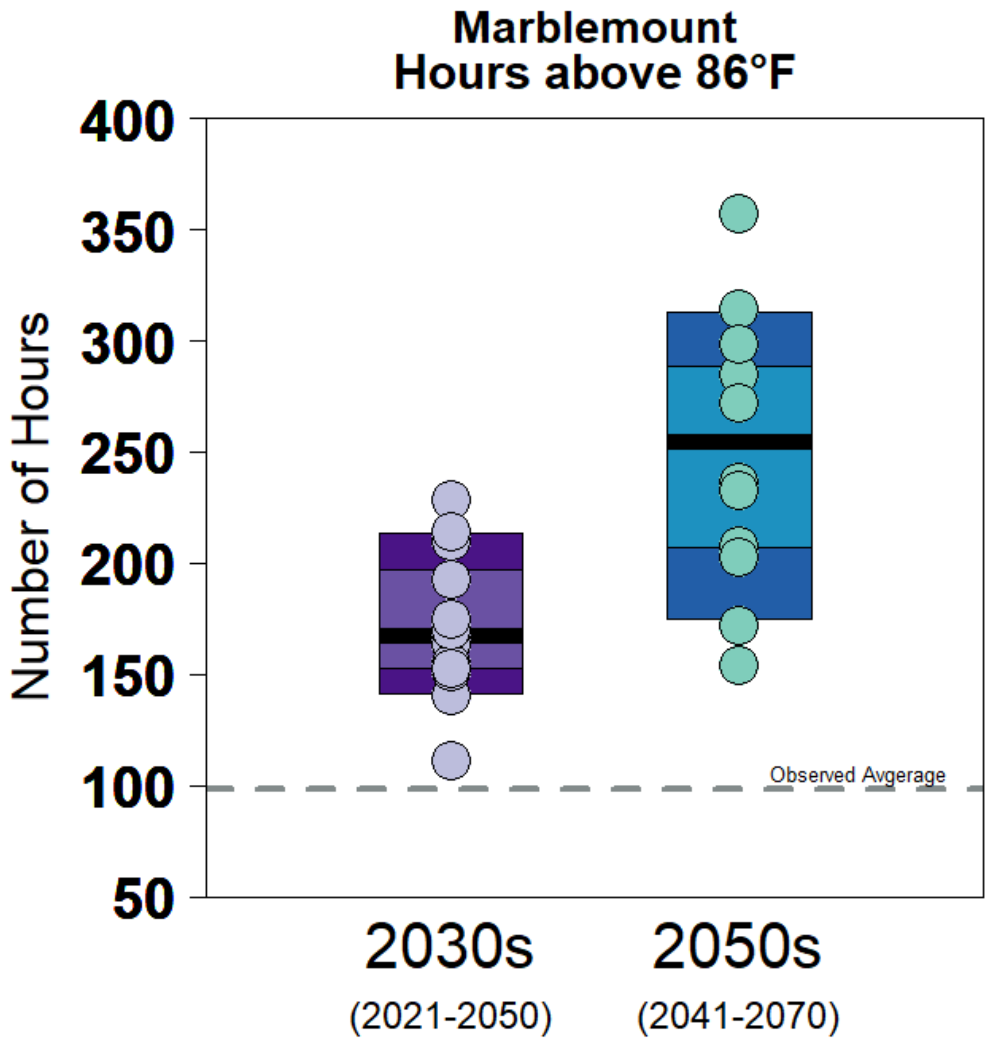
Why does this matter? A change in the number of hours with temperatures above this threshold can affect system capacity and is relevant for transmission system planning. *Winds are also important for cooling on hot days. However, winds are not projected to change drastically. Therefore, climate-related decisions for system capacity and/or transmission system planning should be based on projected changes in temperature.*

- For the 2030s and 2050s, most regional climate models project an increase in the average annual number of hours where temperatures exceed 86. deg. F.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then added that difference to the observed average from the Arlington record (17.3 hours; 1996-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

HOURS ABOVE 86°F | Marblemount

Annual number of hours where temperatures exceed 86°F.



Years	Median	Range
Observations	98.5 hours	N/A
2030s	166.9 hours	111.4 to 228.8 hours
2050s	253.9 hours	154.5 to 356.9 hours

Why does this matter? A change in the number of hours with temperatures above this threshold can affect system capacity and is relevant for transmission system planning. *Winds are also important for cooling on hot days. However, winds are not projected to change drastically. Therefore, climate-related decisions for system capacity and/or transmission system planning should be based on projected changes in temperature.*

- For the 2030s and 2050s, all regional climate models project an increase in number of hours where temperature exceeded 86°F .
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then added that difference to the observed average from the Marblemount record (98.5 hours; 2003-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

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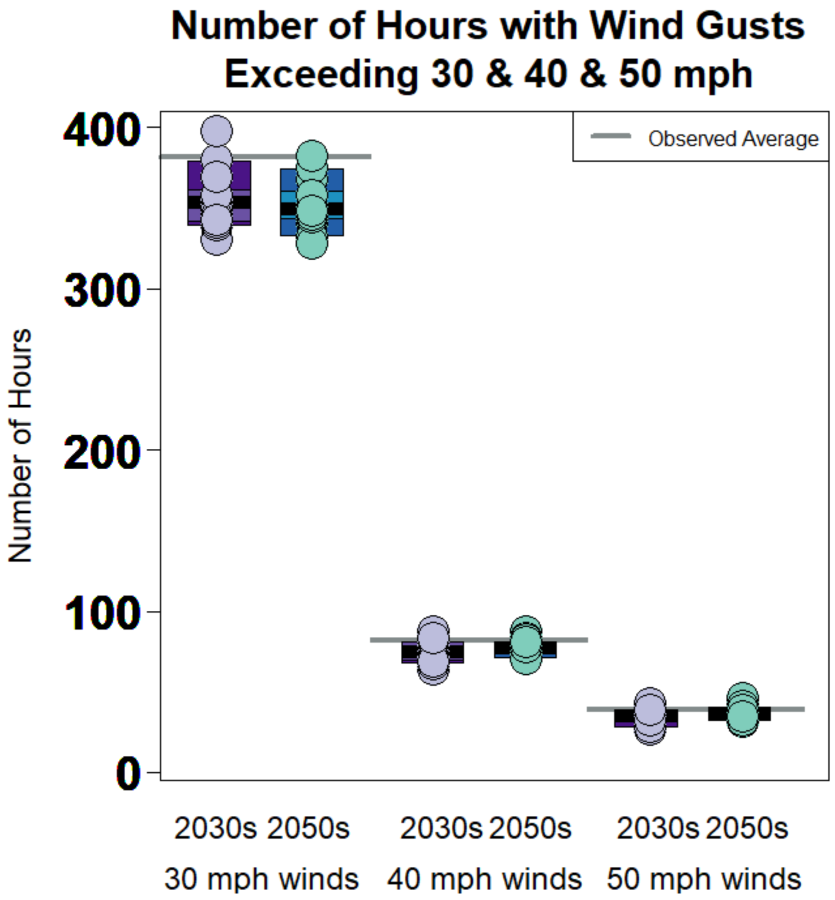
WIND (NON-CONSECUTIVE) | SeaTac

Annual number of hours with wind gusts exceeding 30, 40, 50 mph.



Wind Speed	Years	Median	Range
30 mph	Observations	381. 8 hours	N/A
	2030s	353.5 hours	330.5 hours to 398.1 hours
	2050s	349.4 hours	327.9 hours to 382.5 hours
40 mph	Observations	81.9 hours	N/A
	2030s	74.5 hours	63.9 hours to 87.7 hours
	2050s	76.6 hours	70.8 hours to +87.1 hours
50 mph	Observations	38.5 hours	N/A
	2030s	35.0 hours	26.8 hours to 43.1 hours
	2050s	36.5 hours	31.3 hours to 45.9 hours

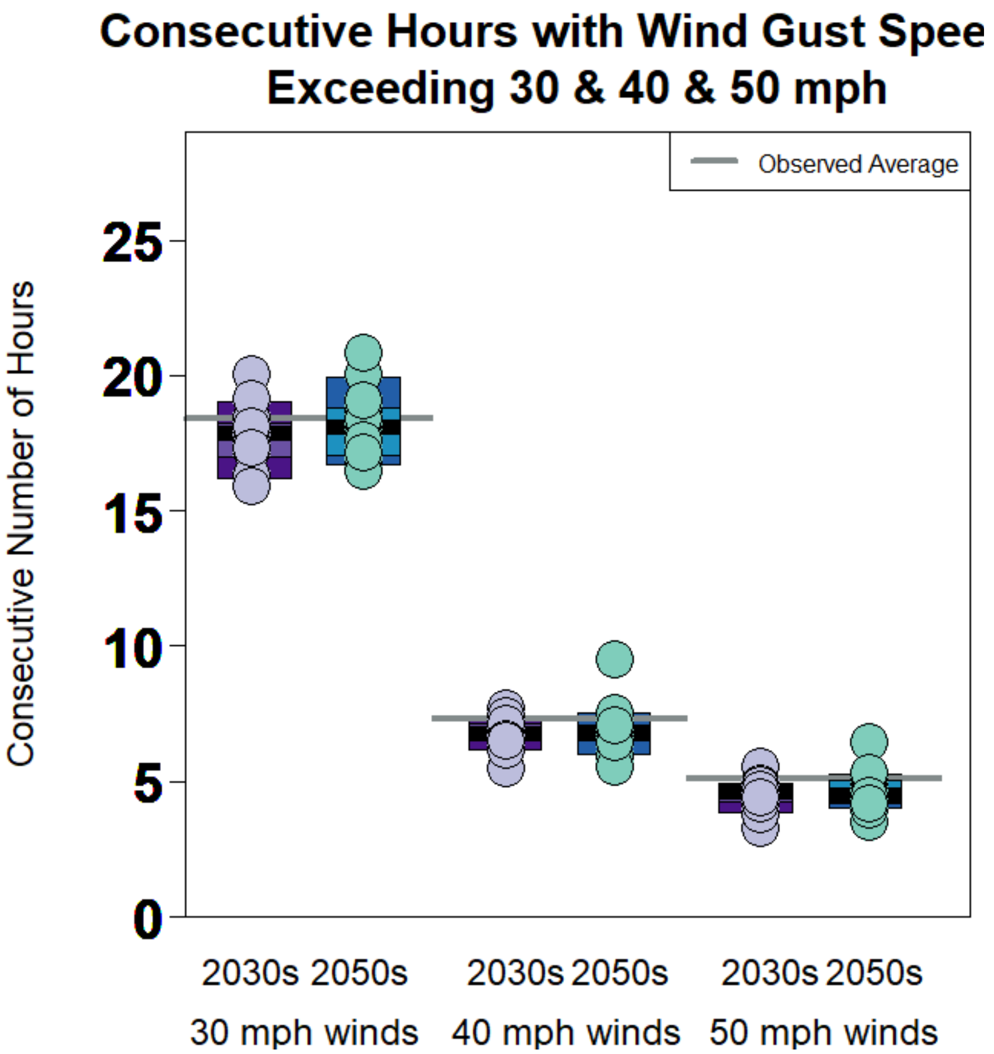
Why does this matter? A change in the number of hours per year with high wind gusts is relevant for outages and storm response in the service area. High winds also affect equipment wind loading and transmission system planning.

- For the 2030s and 2050s, most regional climate models project a slight decrease in the number of hours where wind gust speeds exceed 30, 40, 50 mph.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then applied that change to the observed average from the SeaTac record (381.8 hours; 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

Learn more about this project at: https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/

WIND (CONSECUTIVE) |SeaTac

Average maximum number of consecutive hours per year with wind gusts exceeding 30, 40, 50 mph..



Wind Speed	Years	Median	Range
30 mph	Observation	18.4 hours	N/A
	2030s	17.8 hours	15.9 hours to 20.1 hours
	2050s	18.1 hours	16.5 hours to 20.8 hours
40 mph	Observation	7.3 hours	N/A
	2030s	6.7 hours	5.5 hours to 7.7 hours
	2050s	6.8 hours	5.6 hours to 9.5 hours
50 mph	Observation	5. 1 hours	N/A
	2030s	4.6 hours	3.3 hours to 5.5 hours
	2050s	4.5 hours	3.5 hours to 6.4 hours

Why does this matter? A change in the number of hours per year with high wind gusts is relevant for outages and storm response in the service area. High winds also affect equipment wind loading and transmission system planning.

- For the 2030s and 2050s, most regional climate models project a slight decrease in the number of hours where wind speeds exceed 30, 40, 50 mph.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then applied that change to the observed average from the SeaTac record (18.4 hours; 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

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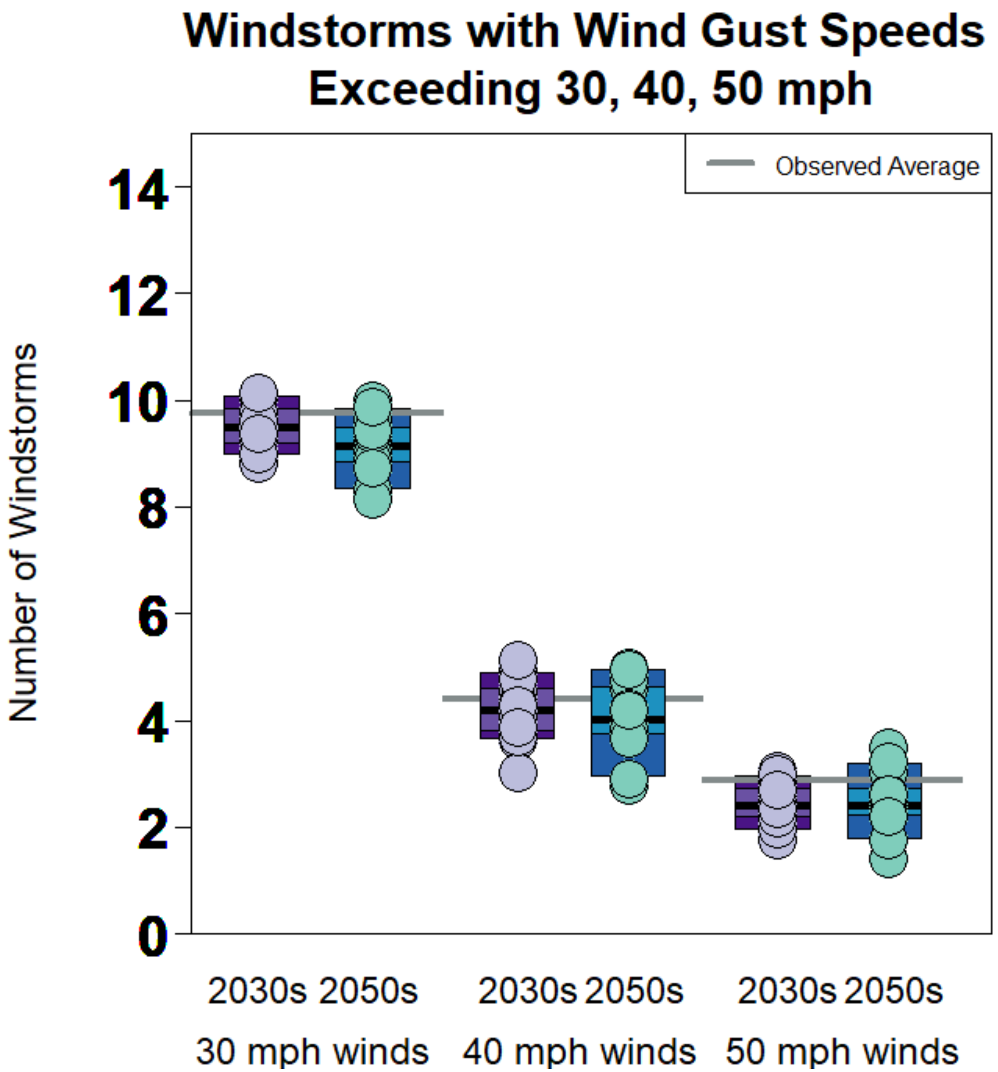
WINDSTORMS | SeaTac

Number of windstorms between August and October. We define an event using a 48-hour window.



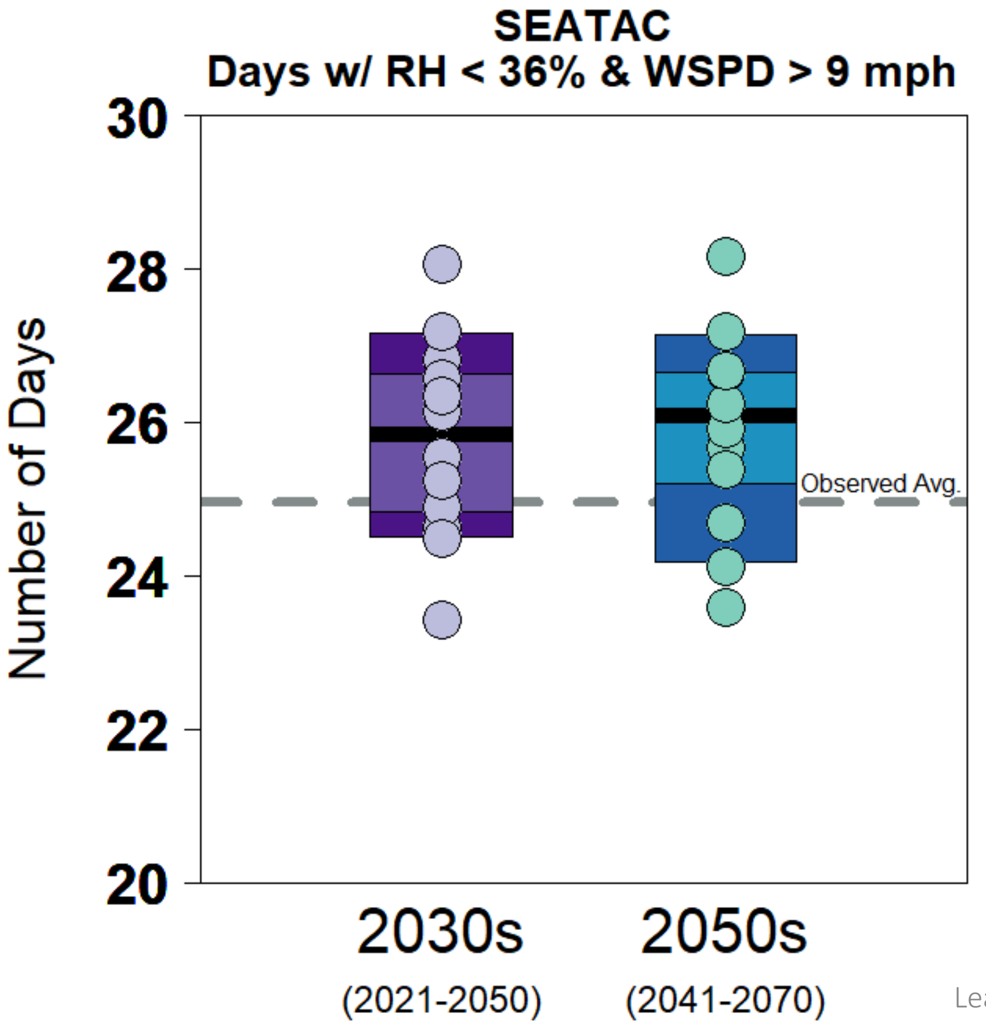
Wind Speed	Years	Median	Range
30 mph (9.8 storms)	Observations	9.8 storms	N/A
	2030s	9.5 hours	8.8 to 10.1 hours
	2050s	9.1 hours	8.1 hours to 10.0 hours
40 mph (4.4 storms)	Observations	4.4 storms	N/A
	2030s	4.2 hours	3.0 hour to 5.1 hours
	2050s	4.0 hours	2.8 hours to 5.0 hours
50 mph (2.9 storms)	Observations	2.9 storms	N/A
	2030s	2.4 hours	1.8 to 3.1 hours
	2050s	2.4 hours	1.4 hours to 3.5 hours

Why does this matter? A change in the number of hours per year with high wind gusts is relevant for outages and storm response in the service area. High winds also affect equipment wind loading and transmission system planning.

- For the 2030s and 2050s, most regional climate models project a slight decrease in the number of windstorms where wind speeds exceed 30, 40, 50 mph.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then applied that change to the observed average from the SeaTac record (9.8 storms; 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

High Wind & Low Humidity | SeaTac

Number of days per year where hourly relative humidity is less than 36% and wind speed is greater than 9 mph for at least 2 hours per day.



Years	Median	Range
Observations	25 days	N/A
2030s	25.8 days	23.4 days to 28.1 days
2050s	26.1 days	23.6 days to 28.2 days

Why does this matter? Low relative humidity in combination with high wind speeds is a critical weather condition that leads to high wildfire potential, especially in western Washington. A change in these factors affects wildfire potential and is relevant for emergency response and hazard mitigation planning. This metric only assesses changes in fire weather conditions; it does not include information on the potential for vegetation drying, which also affects fire potential.

- For the 2030s and 2050s, most regional climate models project an increase in the number of days with major east-wind events.
- Projections are based on a high greenhouse gas scenario (RCP 8.5), using a regional climate model with input from 12 different global climate model projections.
- We estimated future conditions by taking the percent change between modeled historical (1981-2010) and projected number of hours for the 2030s and 2050s, then applied that change to the observed average from the SeaTac record (25 days, 1948-2020).
- Quantile boxes show the 10th, 25th, 75th, and 90th percentiles, and the solid black horizontal line shows the median of 12 models.

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LoadSEER| Observations | SeaTac

This table was created using LoadSEER, which is used to inform system planning for the utility. This table shows temperature in degrees Fahrenheit.

Variable	P2	P5	P10	P25	P75	P90	P95	P98
Max Low	59	60.1	61	63	66.9	69.1	69.6	71.2
Max High	83.7	84.9	86.9	89.1	95	97	98.1	99
Max 3-Day Weighted Avg Low	58.3	59.1	59.6	61.4	65.6	66.7	67.9	70.1
Max 3-Day Weighted Avg High	83.2	84.2	85.3	88.2	94.2	95.7	97.1	98.1
Max 3-Day Weighted Avg High-Low	28.7	29.3	30.1	31.2	34.1	35.4	35.9	36.4
Min Low	28	27.6	27	25	15.1	11.8	10	7
Min High	38.3	37.9	37	35.1	26.1	23	20.4	17.4
Min 3-Day Weighted Avg Low	30.3	29.5	28.1	25.9	16.7	13.3	11.1	8.3
Min 3-Day Weighted Avg High	39.2	39	37.9	36.4	27.7	25.7	21.8	19.4
Min 3-Day Weighted Avg High-Low	4.6	4.5	4.3	4	3.4	2.8	2.3	1.9

LoadSEER| 2030s | SeaTac

This table was created using LoadSEER, which is used to inform system planning for the utility. This table shows temperature in degrees Fahrenheit.

Variable	P2	P5	P10	P25	P75	P90	P95	P98
Max Low	61.68	62.67	63.92	65.73	69.77	71.87	72.69	74.16
Max High	86.37	87.48	89.33	91.23	97.07	99.95	100.85	101.74
Max 3-Day Weighted Avg Low	60.90	61.48	62.40	64.01	68.49	69.61	71.14	73.43
Max 3-Day Weighted Avg High	85.85	86.75	87.65	90.38	96.36	98.51	99.97	100.94
Max 3-Day Weighted Avg High-Low	28.59	29.23	30.03	31.05	33.88	34.99	34.78	34.72
Min Low	30.70	30.59	31.65	33.46	21.27	16.63	14.97	12.37
Min High	42.47	42.11	40.98	40.16	33.74	31.00	27.80	23.23
Min 3-Day Weighted Avg Low	32.64	32.19	32.48	33.50	22.72	18.98	16.30	14.08
Min 3-Day Weighted Avg High	42.99	42.95	42.15	41.57	34.38	33.33	29.10	25.11
Min 3-Day Weighted Avg High-Low	4.49	4.35	4.15	3.94	3.43	2.86	2.36	1.75

LoadSEER| 2050s | SeaTac

This table was created using LoadSEER, which is used to inform system planning for the utility. This table shows temperature in degrees Fahrenheit.

Variable	P2	P5	P10	P25	P75	P90	P95	P98
Max Low	63.78	64.57	65.77	67.85	72.12	74.67	75.19	76.67
Max High	87.73	89.03	91.05	93.41	100.08	102.19	102.83	103.93
Max 3-Day Weighted Avg Low	63.04	63.76	64.52	66.08	70.68	72.36	73.74	75.97
Max 3-Day Weighted Avg High	87.21	88.36	89.55	92.62	99.38	100.90	101.85	103.22
Max 3-Day Weighted Avg High-Low	28.98	29.47	30.15	31.18	33.91	35.10	35.42	35.34
Min Low	31.18	31.25	31.82	33.52	21.33	17.66	15.91	13.38
Min High	43.63	43.51	41.87	40.66	35.01	30.67	27.74	24.05
Min 3-Day Weighted Avg Low	33.11	32.76	32.73	33.45	22.44	19.73	17.21	14.58
Min 3-Day Weighted Avg High	43.99	43.98	42.65	41.98	35.63	32.62	28.52	26.31
Min 3-Day Weighted Avg High-Low	4.48	4.35	4.15	3.90	3.41	2.82	2.38	1.87

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