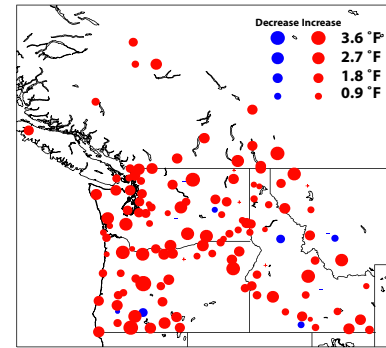


# Regional Climate Change Primer

## Observed changes in Pacific Northwest (PNW) climate

**Temperature:** Observations show that the average surface air temperature in the PNW has increased by ~1.5 °F over the last century. PNW surface air temperatures increased at virtually every location, with remote areas warming as fast as urban areas.

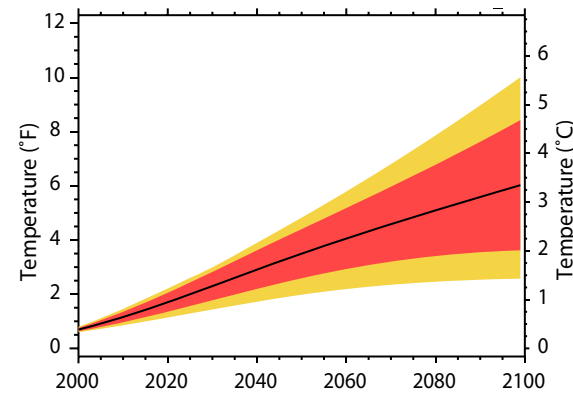


20th century temperature trends

**Precipitation:** Precipitation changes in the PNW over the last century have been dominated by natural variations between relatively dry and relatively wet periods, rather than by a trend in one direction. For example, a slight increase in winter precipitation occurred from 1916 to 2003, largely resulting from an extensive drought in the 1930s. On the other hand, a strong negative trend in winter precipitation occurred from 1947 to 2003.

## Projected 21st century climate changes in PNW climate

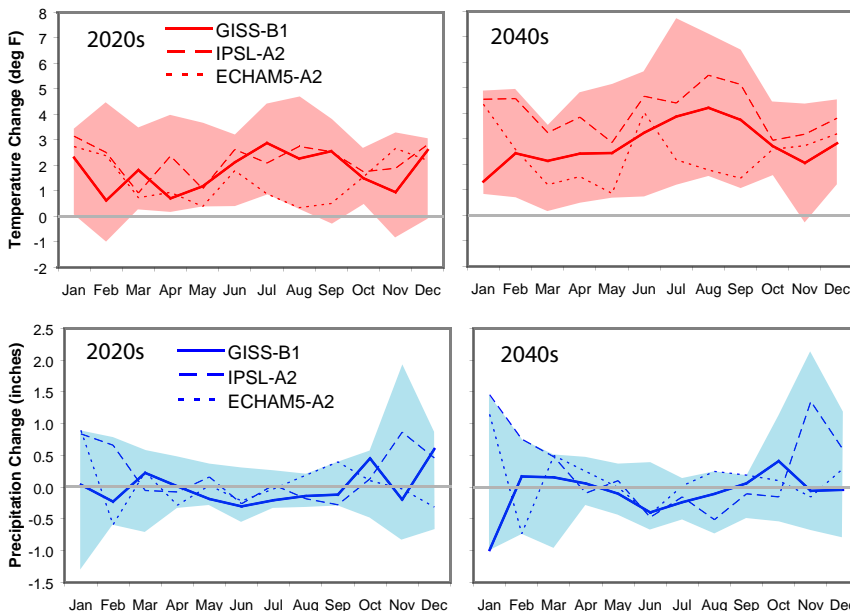
**Temperature and precipitation projections derived from 2007 IPCC report (AR4) climate models:** Climate models generally project increases in PNW surface air temperatures during all seasons. These projected temperature increases exceed observed 20th century year-to-year variability. Many climate models project small increases in precipitation during the winter, however, projected precipitation changes are smaller than 20th century year-to-year variability. When compared to previous PNW climate change scenarios, AR4 climate model projections show smaller temperature increases and drier 2020s precipitation projections. These differences are primarily due to the consideration of more climate models and an improved method for establishing the baseline to which future changes are compared (All changes reported here are calculated relative to the average climate of the 1970-2000.). Beyond mid-century, climate change projections are less certain because they depend increasingly on greenhouse gas emission choices over the next few decades.



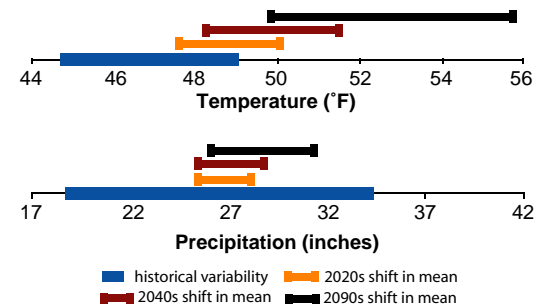
Projected temperature increases

Decade	Temperature (°F)	Precipitation (%)
2020s	low	0.7
	average	1.9
	high	3.2
2040s	low	1.4
	average	2.9
	high	4.6
2080s	low	2.9
	average	5.6
	high	8.8

Projected changes in annual PNW temperature and precipitation



Projected changes in monthly PNW temperature and precipitation. The lines show changes associated with warm (IPSL-A2), cool (GISS-B1) and middle of the road (ECHAM5-A2) climate change scenarios.



Comparison of observed year-to-year variability and projected shifts in temperature and precipitation from climate models