

Quantifying the Impacts of Climate Change on the Operation of the Electric Grid

Aspen Global Change Institute

David Miller, PhD

California Public Utilities Commission

Energy Division Modeling Section

david.miller@cpuc.ca.gov

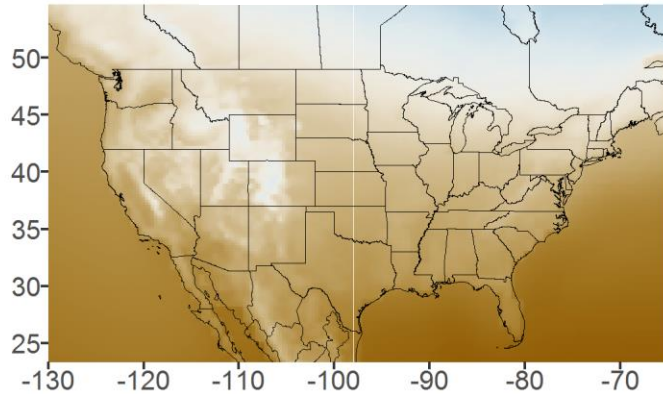
September 14, 2021



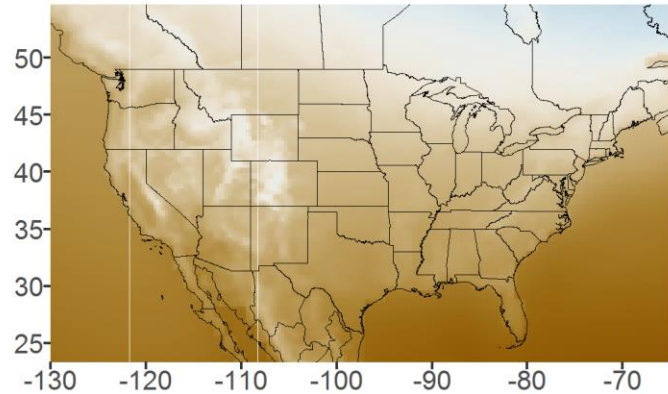
Example Global Atmospheric Model* Data

Averaged Surface Temperature, February, 1 AM, Pacific Time

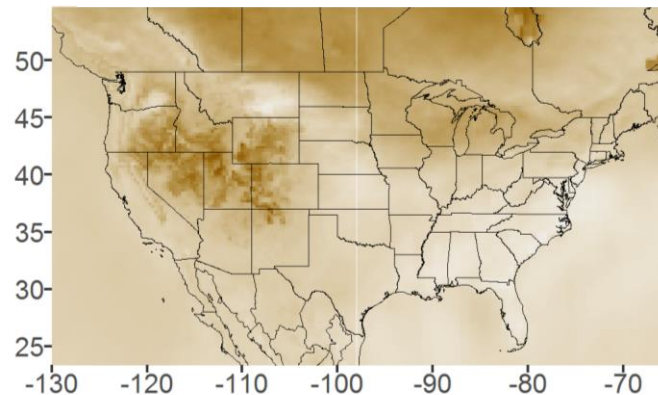
$\overline{GAM}(\text{Current})$



$\overline{GAM}(\text{Future: } 2^{\circ}\text{C})$



$\Delta\overline{GAM}(\text{Feb, 1AM})$



* CAM5 /
Wehner

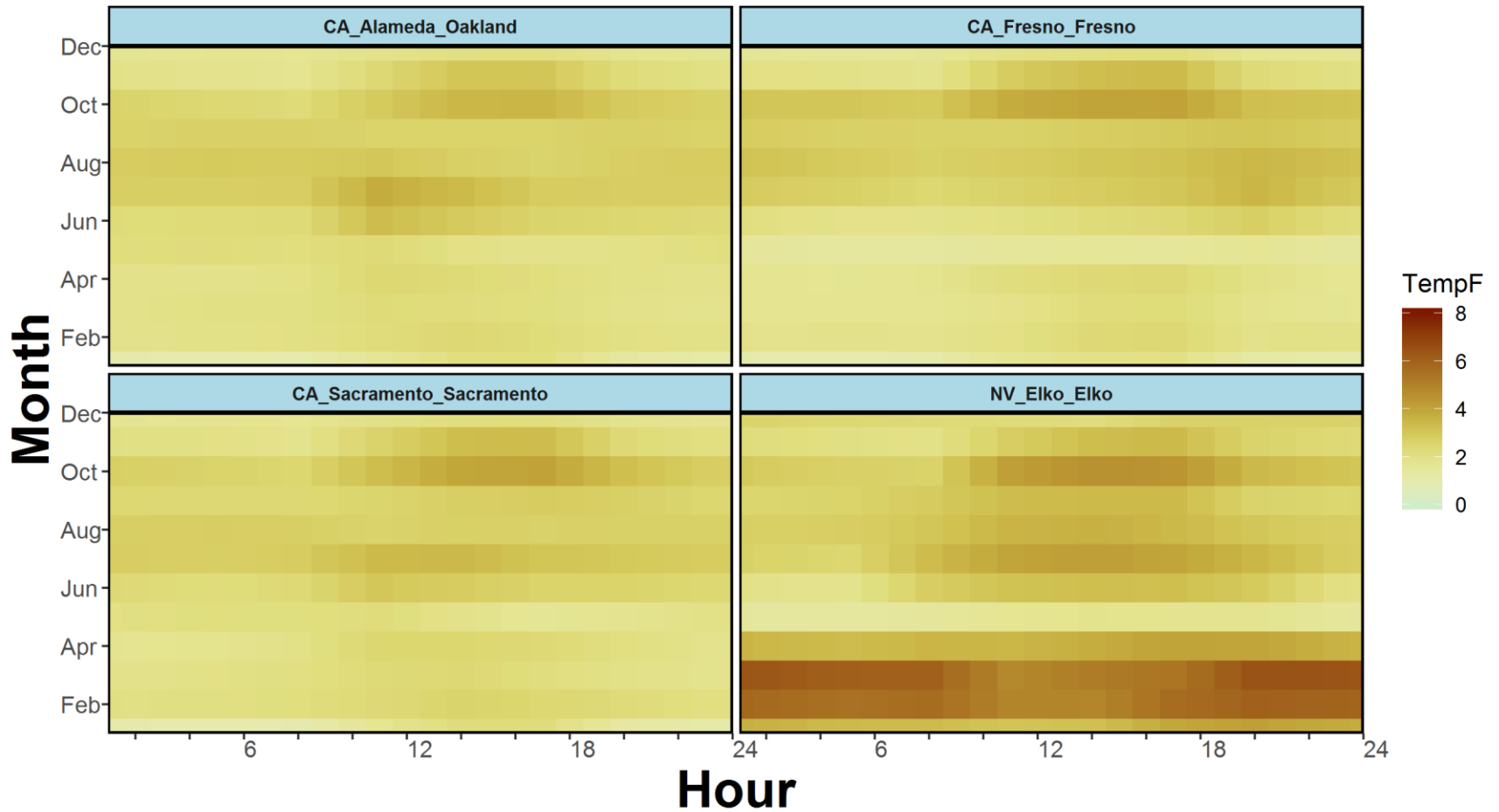
Latitude

Longitude

- Variables: Relative Humidity, Incident Solar Radiation, Wind speed
- Other: Developing hydrological perturbation approach



Temperature Anomaly $\Delta \overline{GAM}(\text{Month, Hour})$ 2 degrees C versus Current



Pilot Study: Transformer Hourly Violations

Current versus 2°C Warmer Climate

