Forecasting Changes in California's Climate

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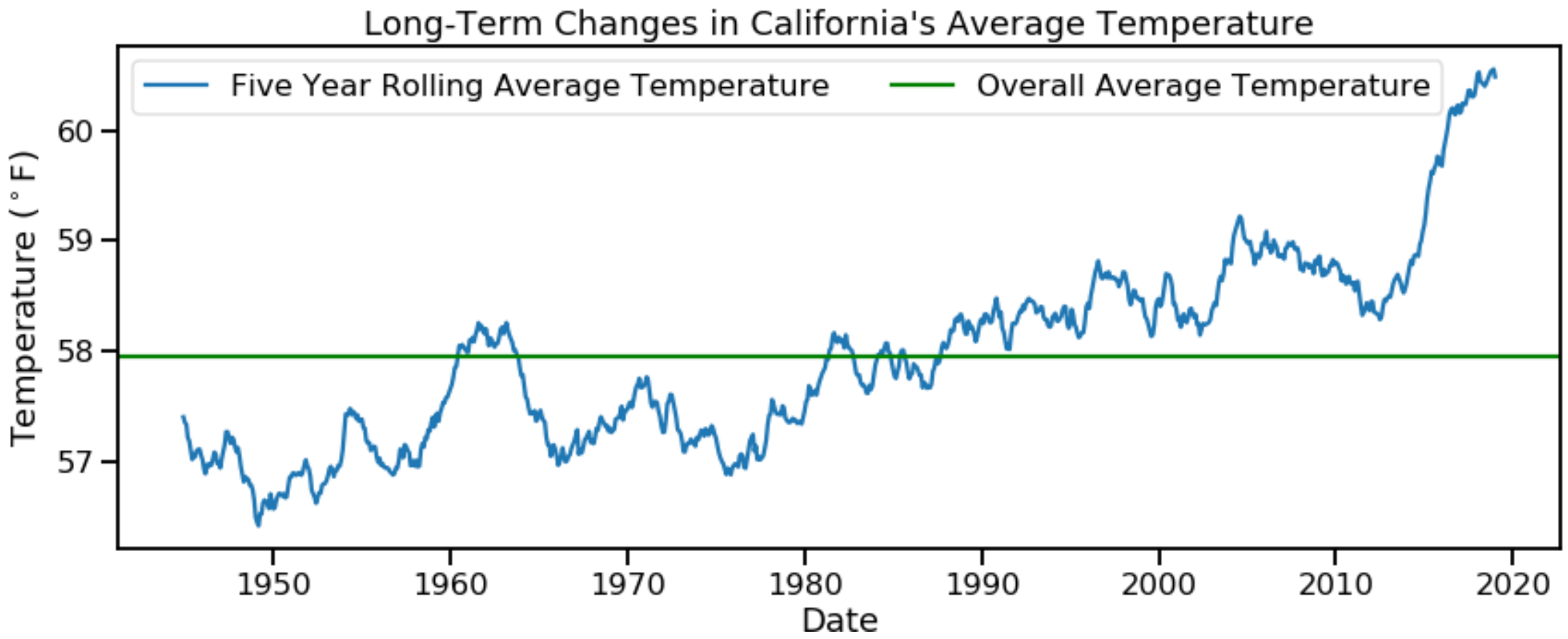
Outline

- Overview of the Data
- Trends in Average Temperature, Cooling Degree Days, and Precipitation
- Forecasting Methodology
- Forecasting Results
- Conclusions and Recommendations

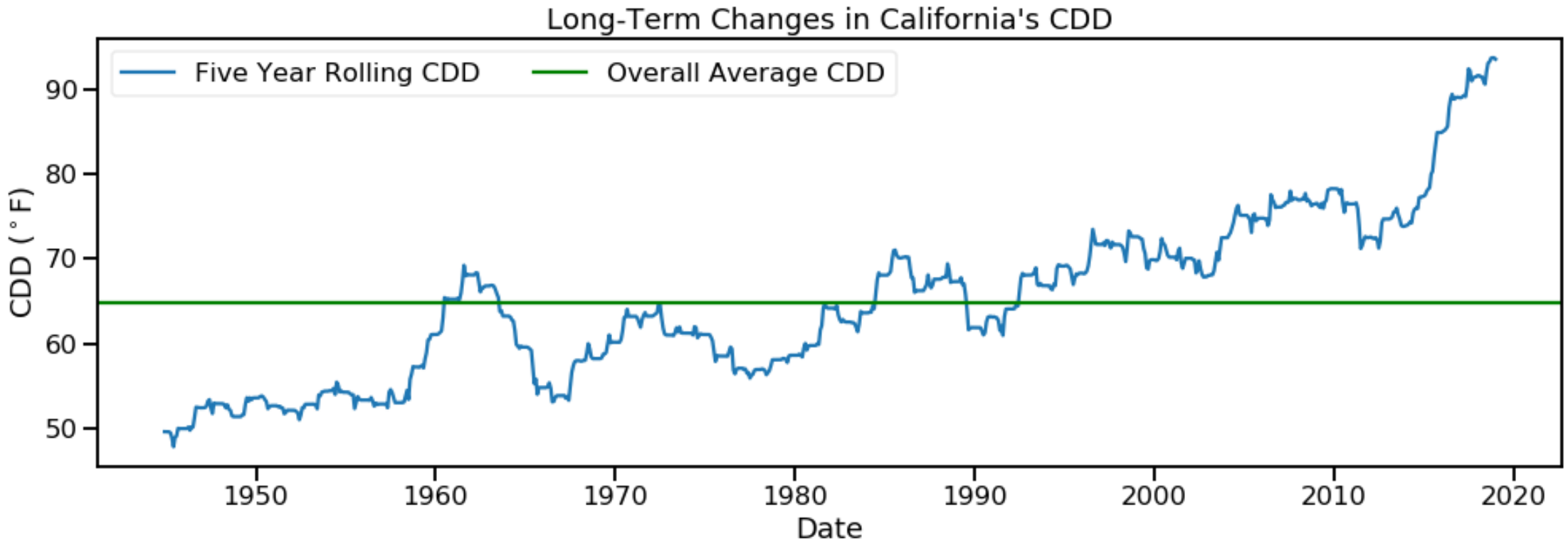
Overview of the Data

- Climate at a Glance – National Centers for Environmental Information
- Average Monthly Temperature, Cooling Degree Days (CDD), and Precipitation data from 1940 to 2018
- All data is publicly available in JSON format

Trends in Temperature

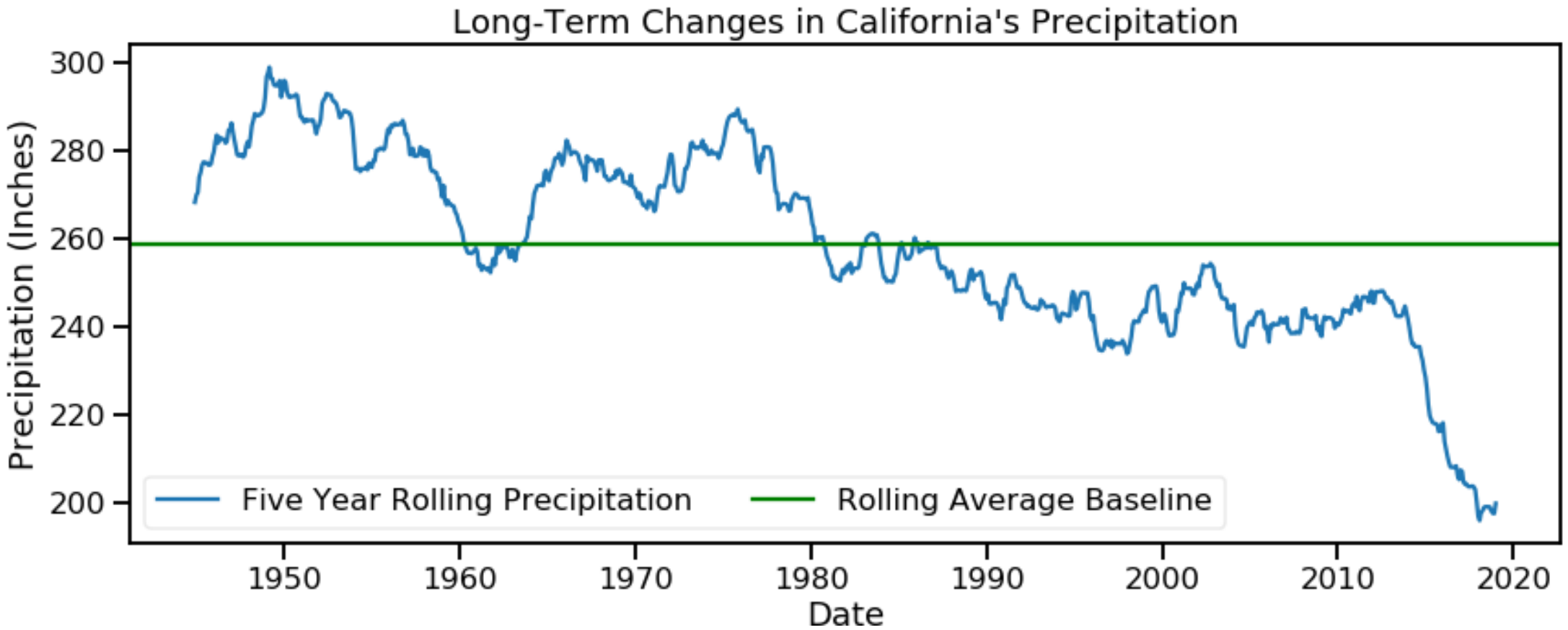


Trends in CDD



$CDD = Average\ Temp$ - 65°F

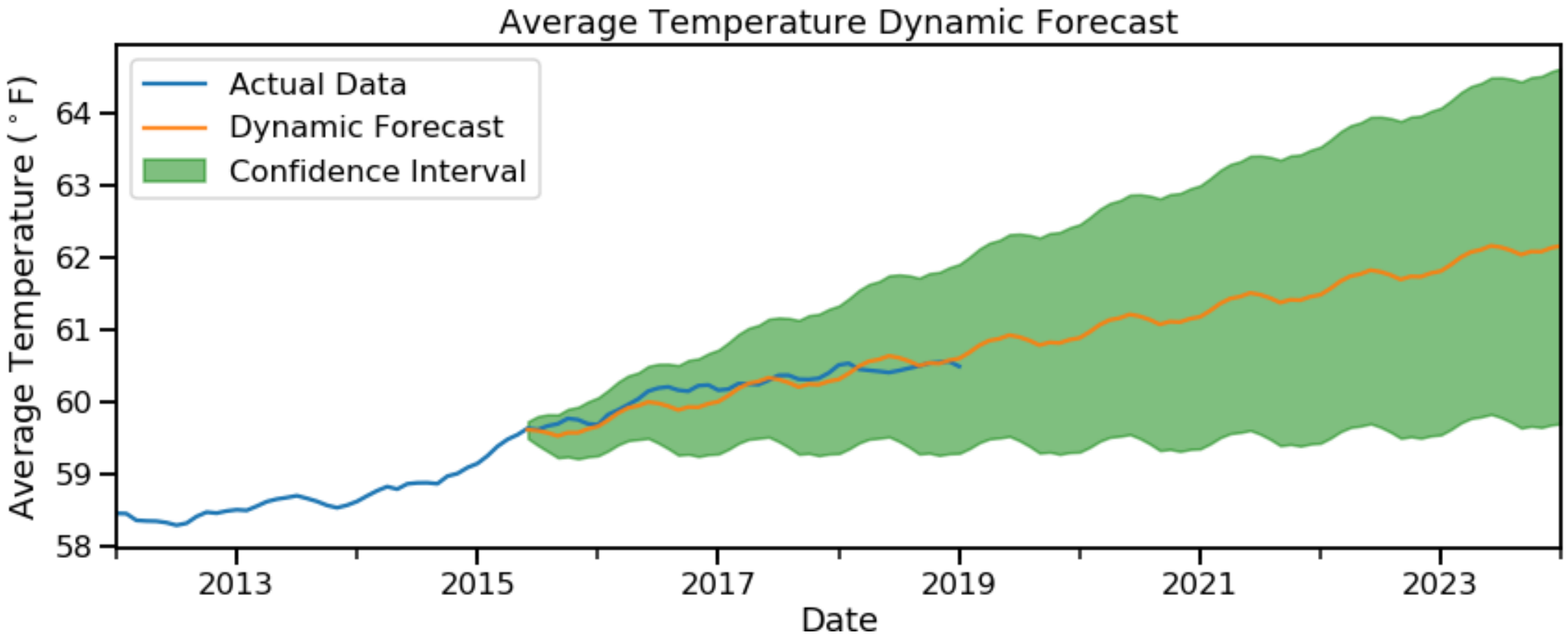
Trends in Precipitation



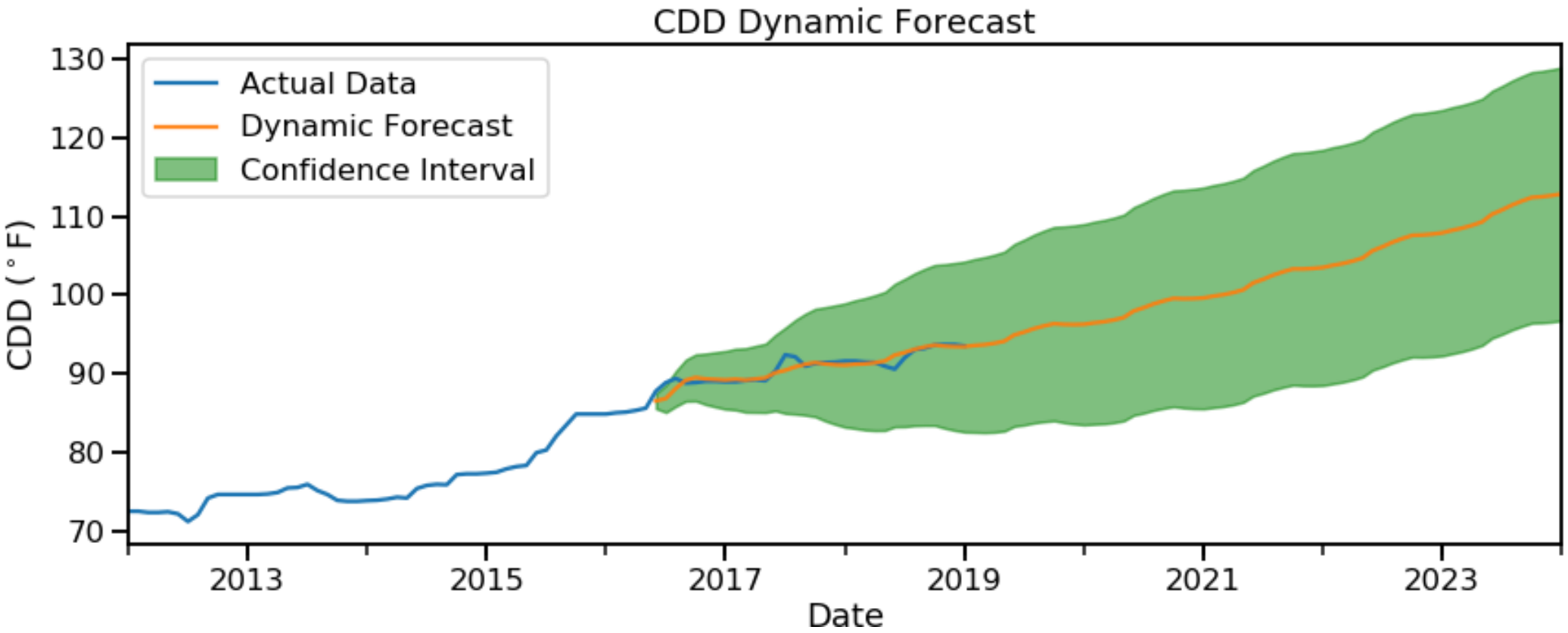
Forecasting Methodology

- Data from the past is used to make predictions about the future with the **S**easonal **A**utoregressive **I**ntegrated **M**oving **A**verage (SARIMA) model
- Takes into account changes over recent months as well as yearly trends.
- Models are validated based on what we already know
  - How well does data from 2012-2016 predict what happens in 2017?

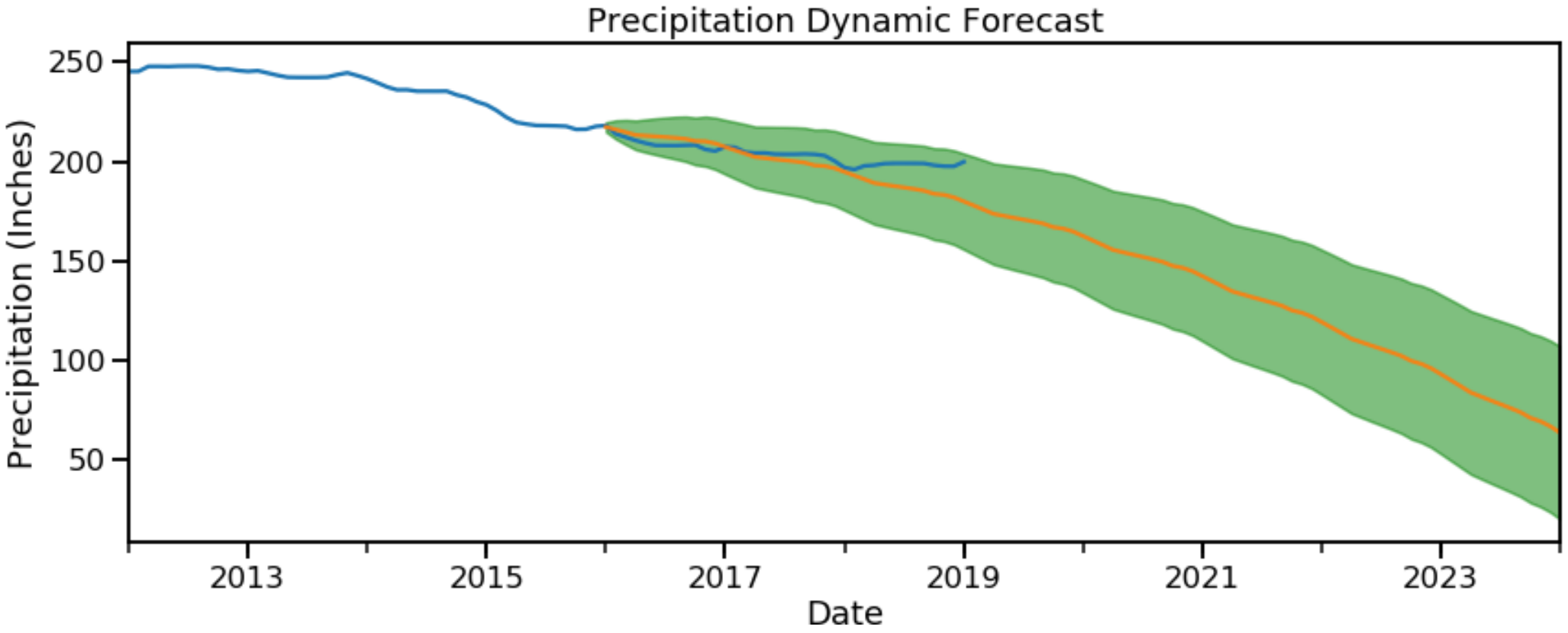
Average Temperature Predictions



CDD Predictions



Precipitation Predictions



Conclusions and Recommendations

- More cooling degree days in the future will have an impact on energy expenditures
  - Potential danger to older populations if this becomes unaffordable
- Decreases in yearly precipitation will have an impact on California's agriculture goods
- The best way to combat these issues is to refocus analysis on a regional level