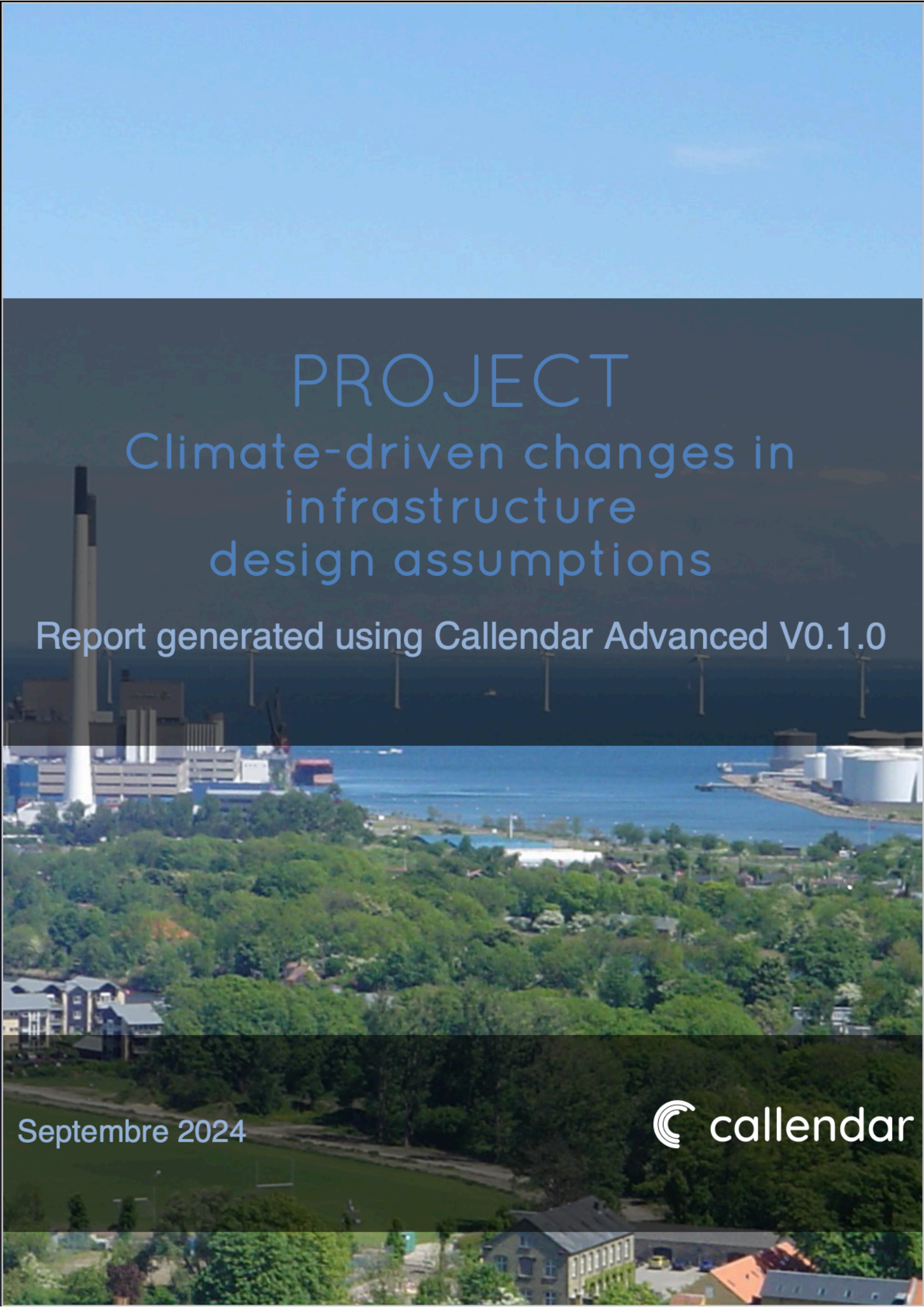


PROJECT

Climate-driven changes in infrastructure design assumptions

Report generated using Callendar Advanced V0.1.0

Septembre 2024

callendar

Table of content

1. Introduction and goals

Companies engaged in the design and construction of both on- and off-shore infrastructures rely on meteorological and oceanographic assumptions. Variables such as temperature, wind, precipitation, wave height, and sea level play pivotal roles in project feasibility, design, and operation. However, these assumptions, typically grounded in a study of past weather records, may become inadequate over a project's lifetime, especially under the influence of climate change.

This report is designed to help address this challenge. It provides a summary of future local climate projections crucial for designing resilient infrastructures.

It was generated automatically based state-of-the-art climate projections using Callendar Advanced, Callendar's tool designed to automatically generate precise and actionable local climate insights.

This report is delivered with:

- A user guide detailing the data and methodology used,
- Spreadsheets containing the raw and intermediate data for the project site.

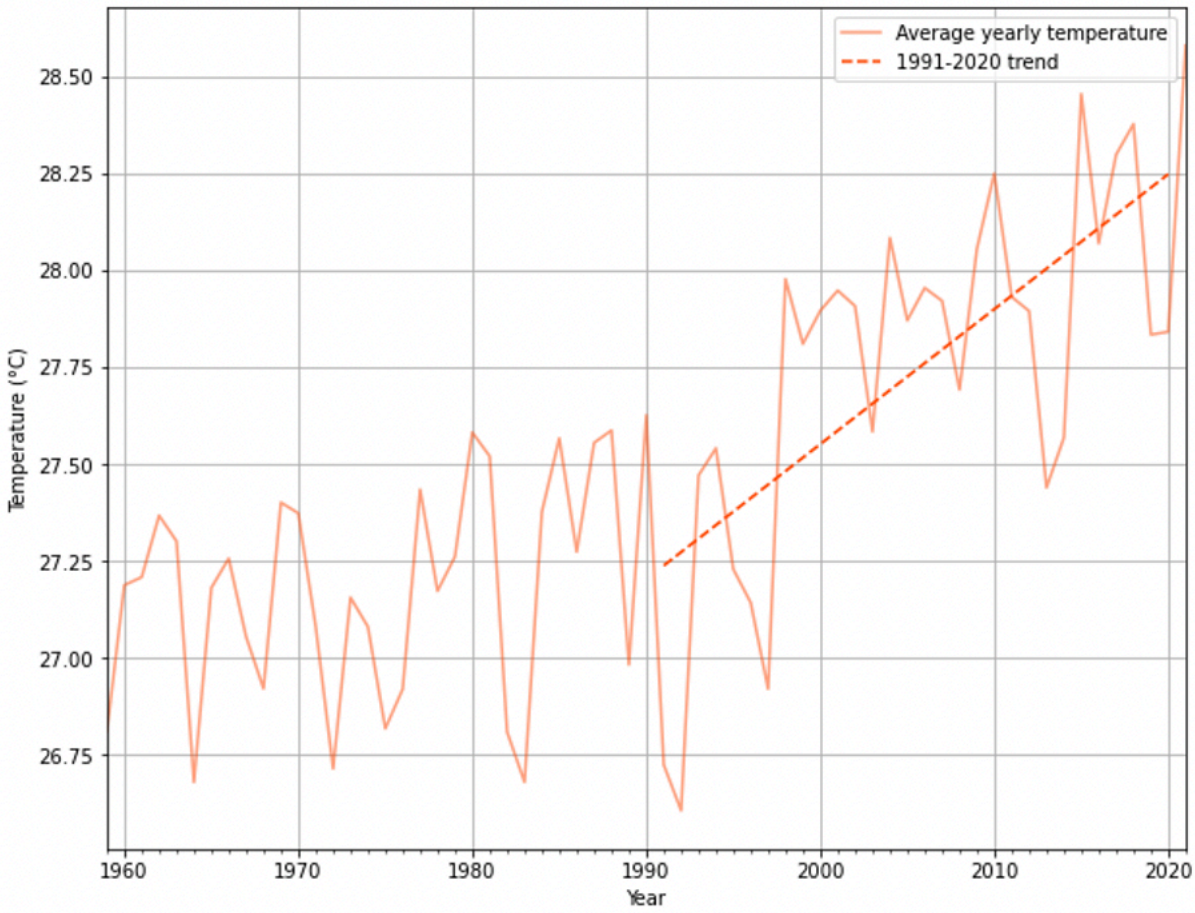


Figure 1: Average annual temperature and trend

3. Future projections

Temperature is very likely to increase significantly during the 21st century.

Over the next three decades, the best estimate of annual average temperature is approximately 28.6°C with little influence from the emissions scenario.

This is consistent with the warming trend observed over the last 3 decades. The median projection for average annual temperature is higher than the natural variability (90 CI). This strongly suggests that historical temperatures do not provide good guidance even for short-term project design.

The influence of emissions on temperatures becomes significant around the middle of the century. By 2050, the average yearly temperature is projected to be 0.6°C higher in the worst-case emissions scenario (SSP5-8.5) compared to the best-case scenario (SSP1-2.6). At the end of the century, this difference approaches 2.5 degrees.

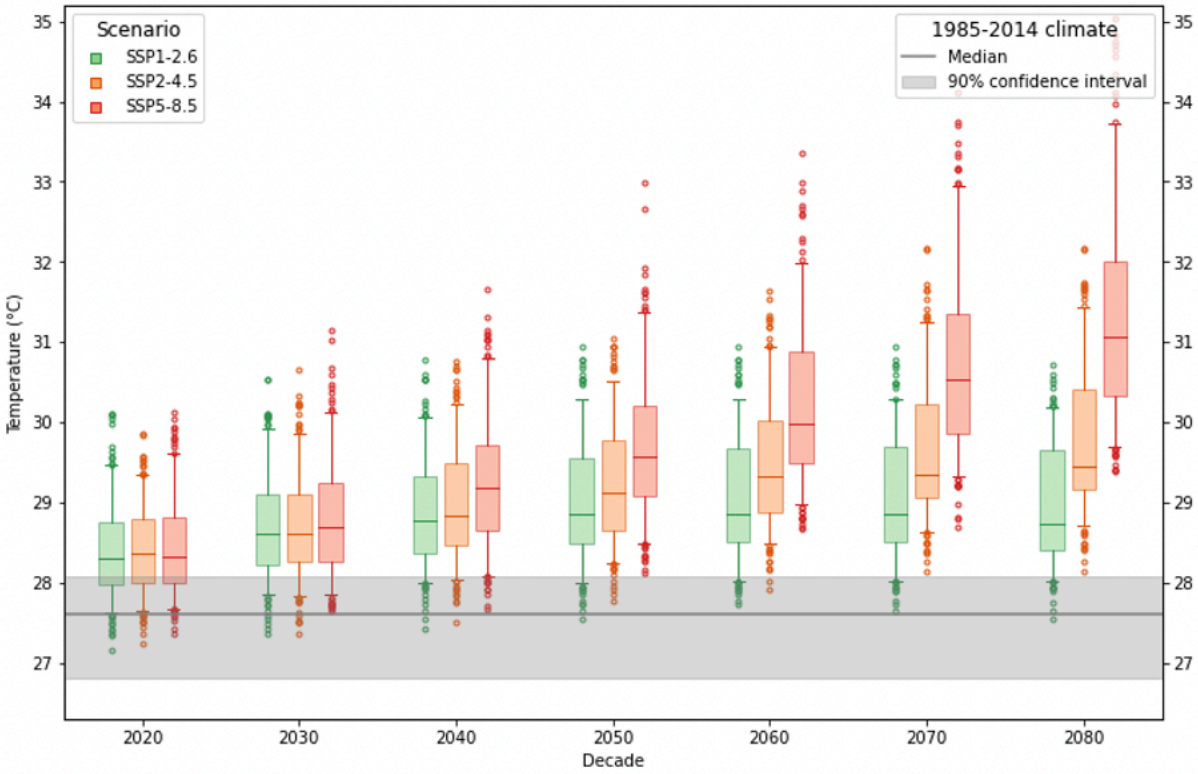
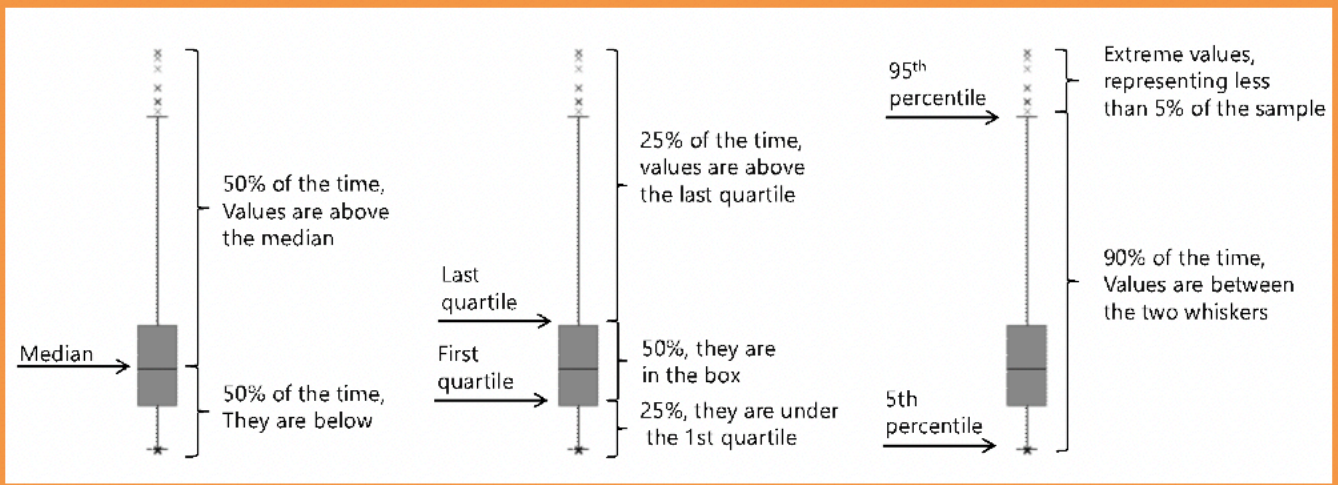


Figure 2 : Annual temperature, multimodel boxplot

Box 1: how to read a boxplot

A boxplot is a graphical method to simply convey the distribution of data. It allows to visually estimate the most important data percentiles (minimum, maximum, median, first and last quartiles) and various key characteristics of a sample (spread, skewness, outliers, etc.).

Several variations of this visual data display exist. In this document, boxplots can be read as follows:



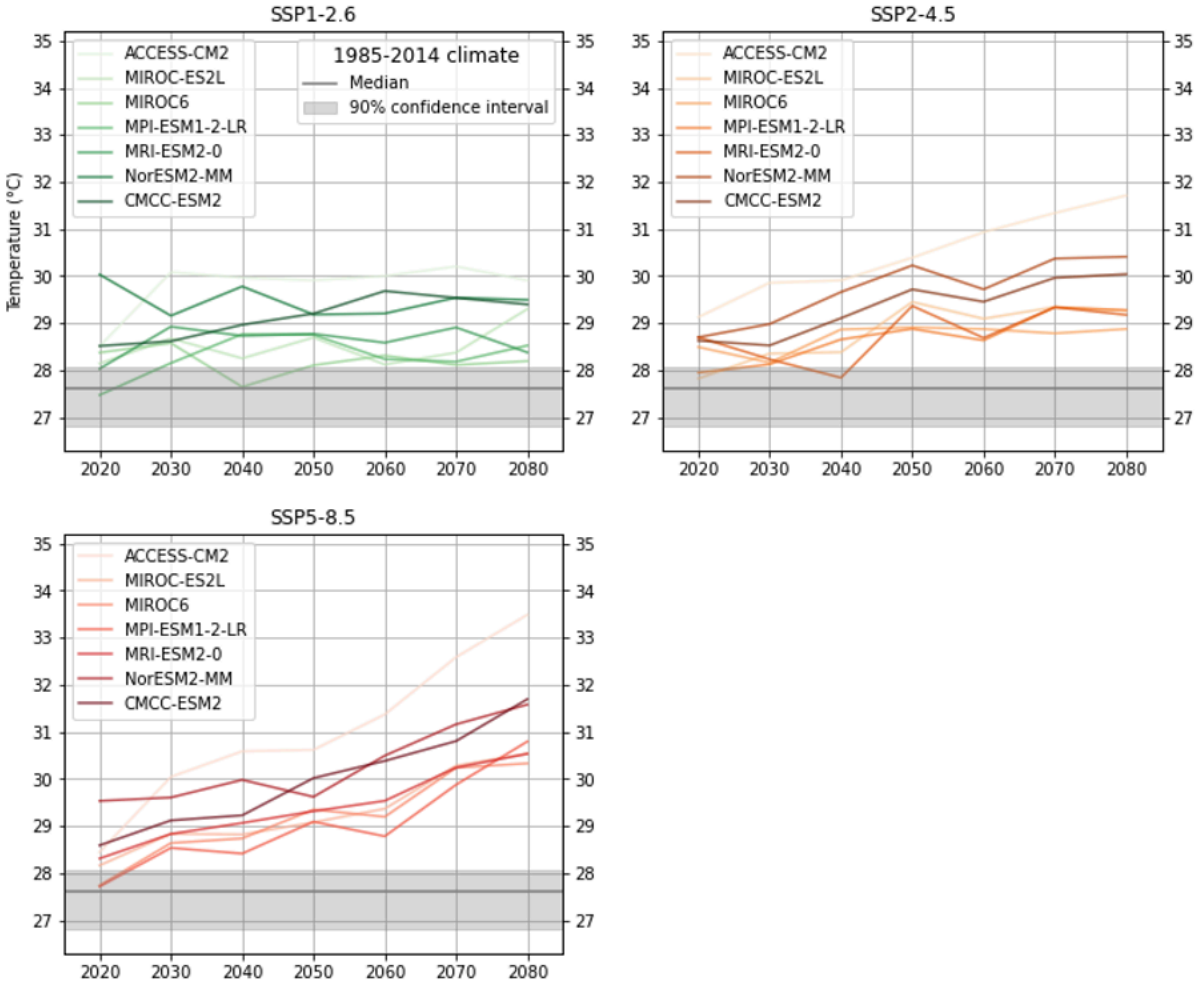


Figure 4: Average temperature by decade (30 year rolling average)