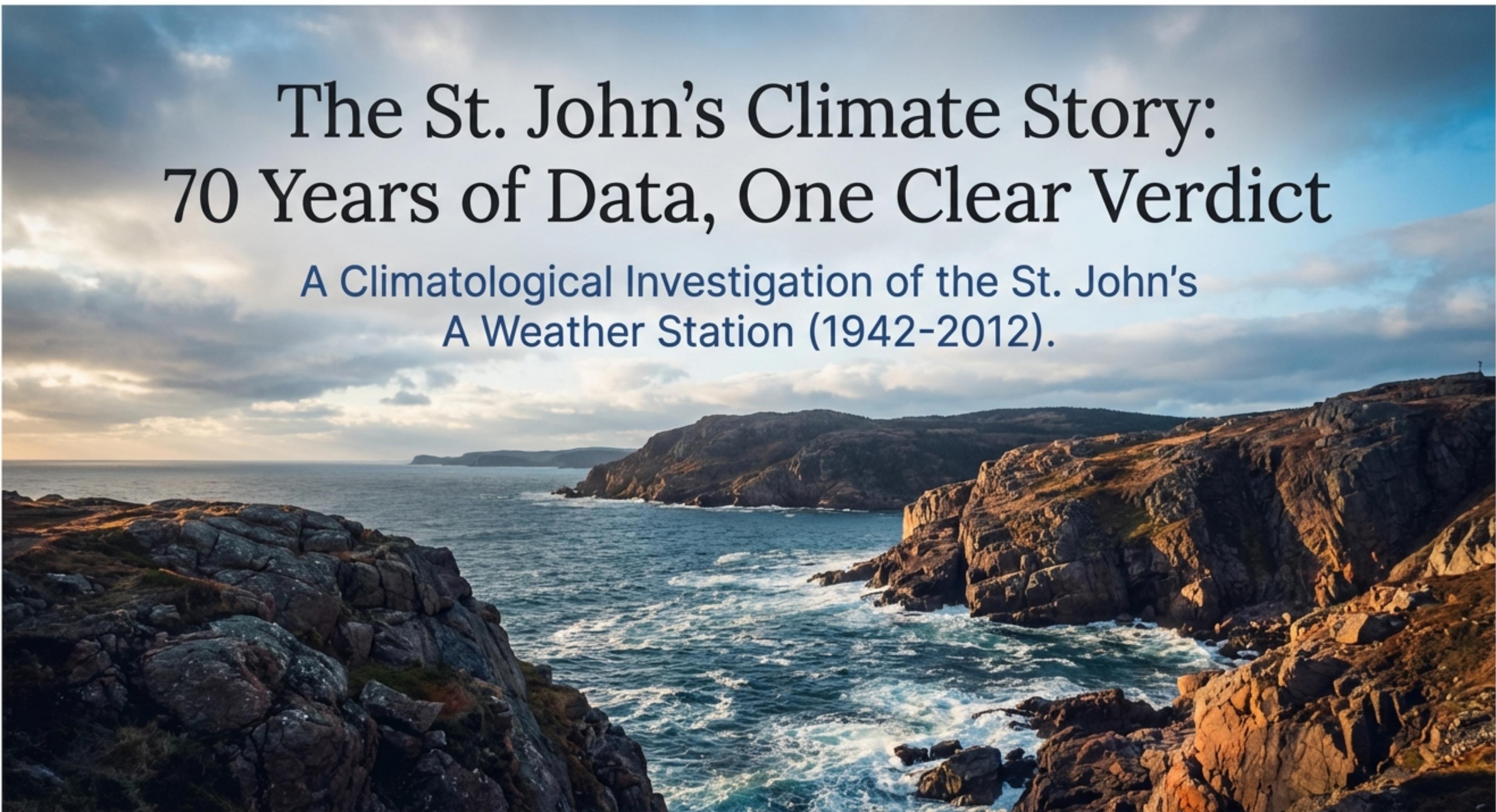


The St. John's Climate Story: 70 Years of Data, One Clear Verdict

A Climatological Investigation of the St. John's
A Weather Station (1942-2012).





The Central Question: Has Our Local Climate Fundamentally Changed?

Over 70 years, has St. John's experienced a measurable, long-term shift in its climate, or is our weather simply a story of year-to-year variability?

Our Hypothesis

- Given global climate patterns, we expect to find a statistically significant warming trend.
- We also anticipate a corresponding shift in the frequency and nature of extreme temperature events.

The Case File: A 70-Year Record of Daily Weather

The Data

- **Source:** St. John's A Weather Station
- **Timeframe:** 1942 – 2012
- **Variables:** Daily & Monthly Records for Mean, Max, and Min Temperatures; Total Precipitation (Rain & Snow).

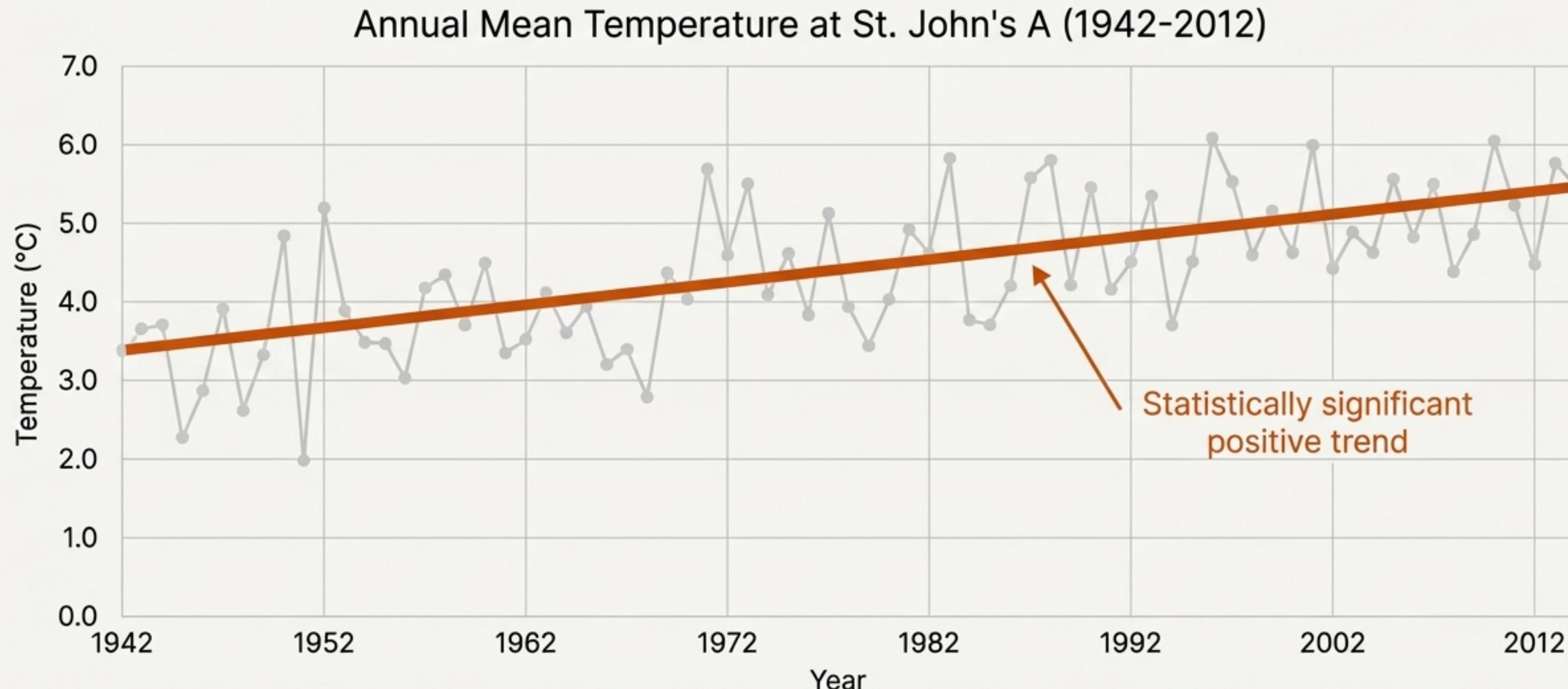
The Methods

- **Time Series Analysis:** To identify long-term trends over time.
- **Distributional Shift:** To compare the climate 'profile' of the past vs. the present.
- **Extreme Value Analysis:** To quantify changes in hot and cold events.
- **Growing Degree Days (GDD):** To measure heat accumulation with tangible impacts.



Clue #1: A Clear and Statistically Significant Warming Trend

Analysis of the 70-year record reveals an unmistakable upward slope in the annual mean temperature at St. John's A station.



Clue #2: The Warming is Consistent Across All Four Seasons

The upward temperature trend is not isolated to a single season. Warming is observed in Winter, Spring, Summer, and Fall, demonstrating a fundamental shift in the year-round climate.

Winter Mean Temperature



Spring Mean Temperature



Summer Mean Temperature

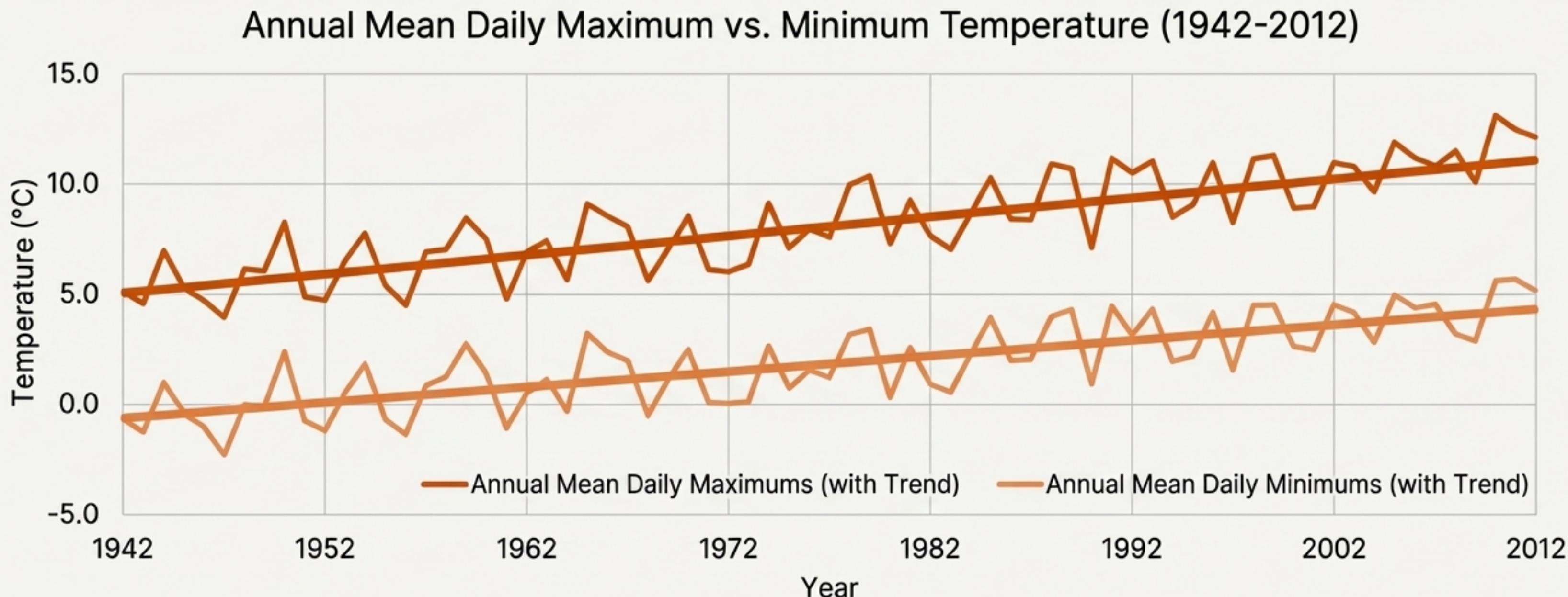


Fall Mean Temperature



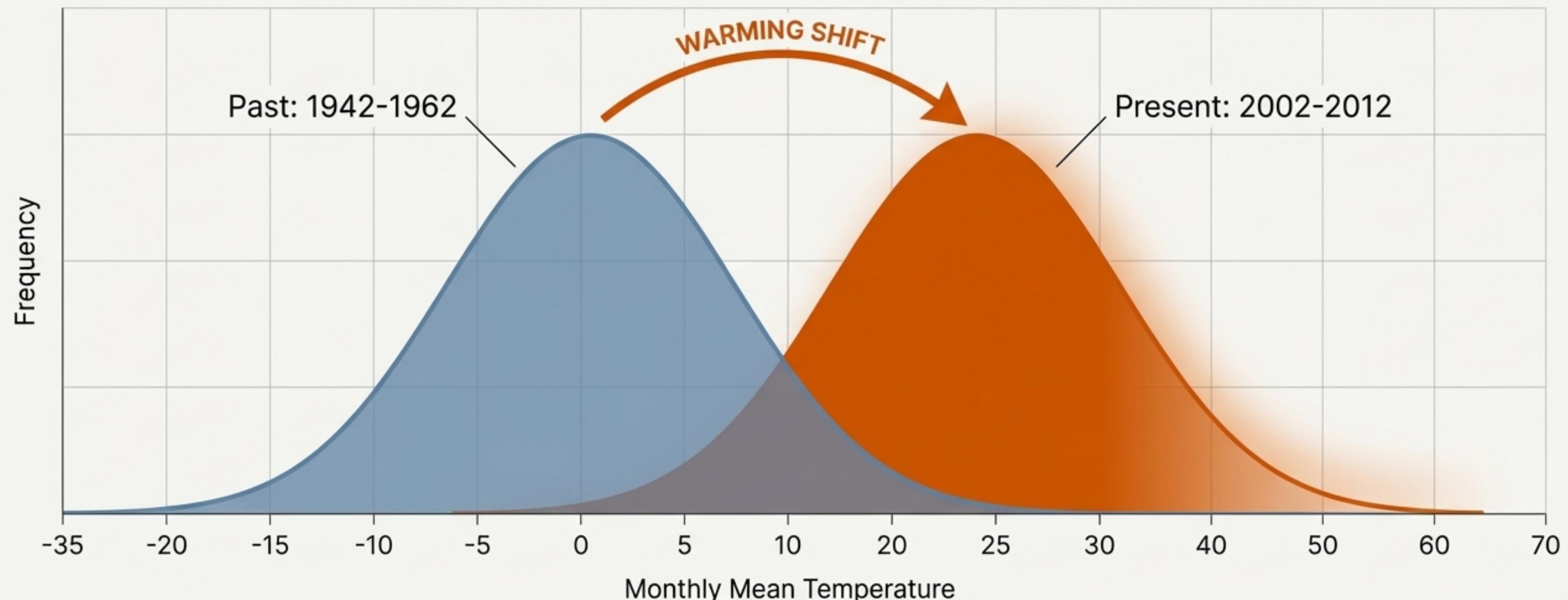
Clue #3: The Entire Daily Temperature Range Is Shifting Upward

The warming trend is comprehensive. Both daily maximum and daily minimum temperatures are increasing in parallel over the 70-year period.



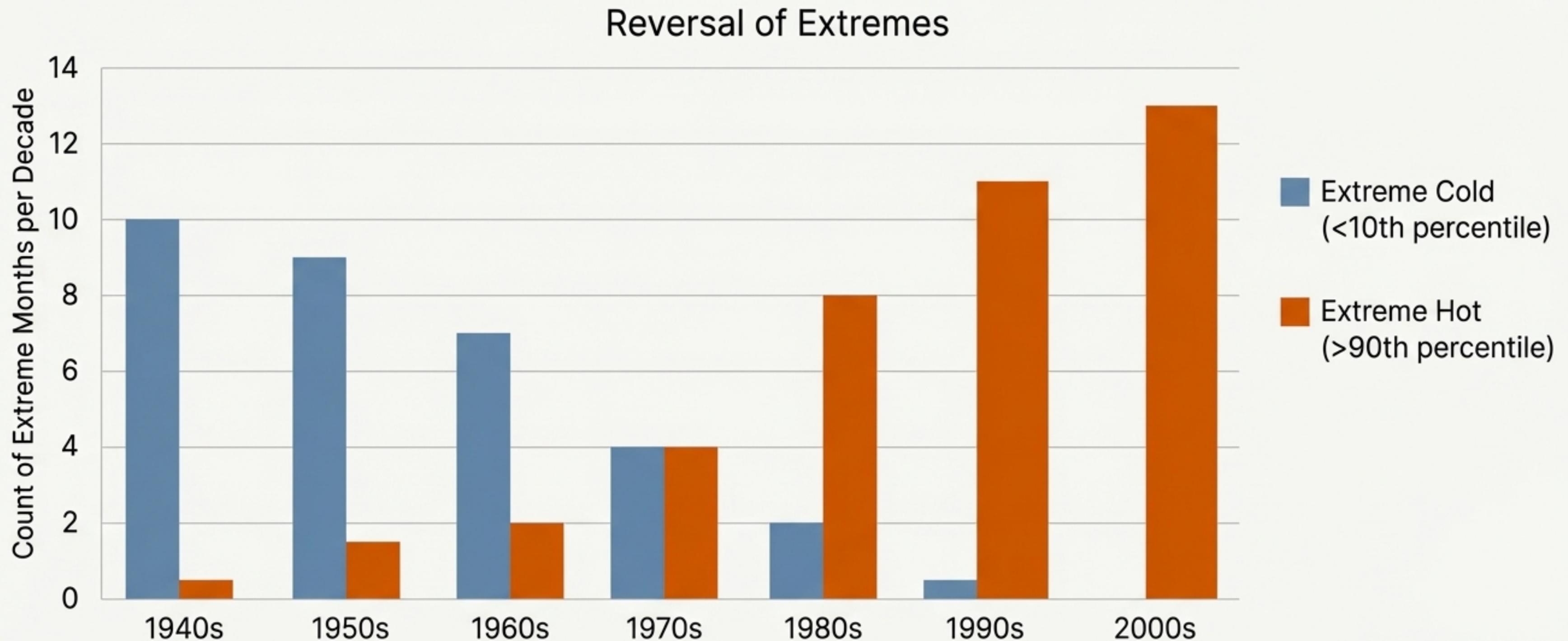
The Pivotal Evidence: Our Entire Climate Profile Has Shifted Warmer.

Comparing the distribution of monthly temperatures from the start of our record to the end reveals a dramatic shift. The “average” month today is significantly warmer than it was 70 years ago.



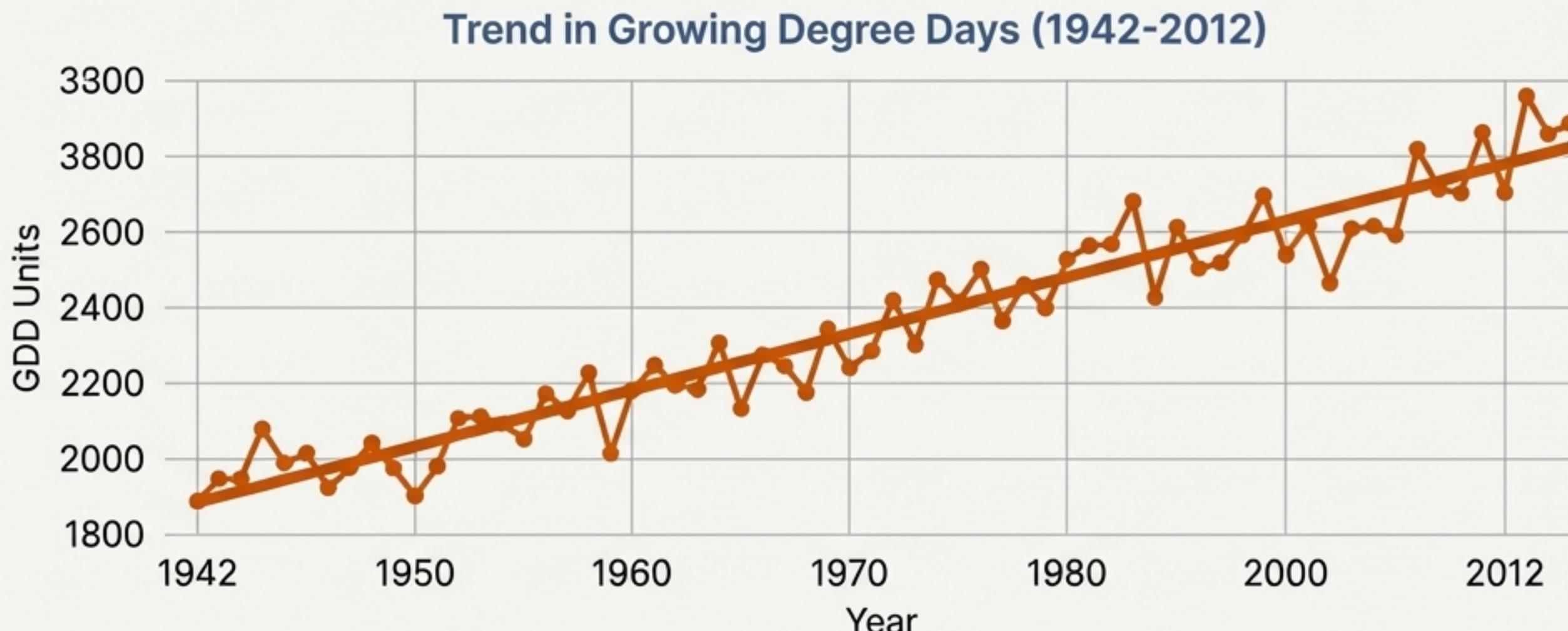
Clue #4: Extreme Cold Months Have Vanished, Replaced by Frequent Extreme Heat.

In the early decades, months colder than the 10th percentile were common. In recent decades, they have virtually disappeared. Conversely, months warmer than the 90th percentile, once rare, are now the norm.



Clue #5: The Tangible Impact—A Longer and Warmer Growing Season

We can measure the heat available for biological growth using Growing Degree Days (GDD). The data shows a steady accumulation of heat year after year, directly translating to a more favorable environment for vegetation.



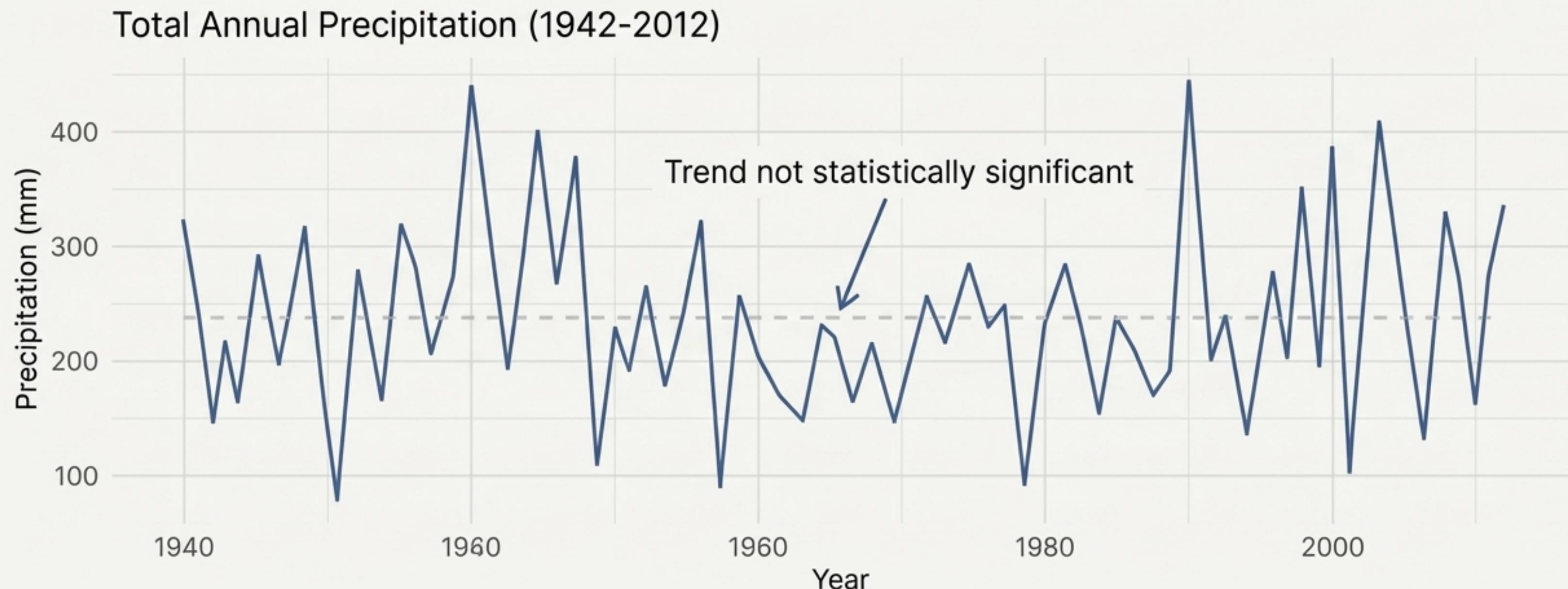
GDD measures accumulated heat above a baseline temperature, critical for plant and insect development.

Trend:

+0.31 GDD units per year

An Honest Investigation: The Precipitation Puzzle Shows a Different Pattern.

Unlike the clear warming signal in temperature, the 70-year record for total annual precipitation shows no distinct long-term trend. The story of precipitation in St. John's is one of high year-to-year variability and unpredictability.



The Verdict: St. John's A Has Experienced a Definitive and Significant Warming.



The Temperature Verdict (Confirmed)

- A significant, long-term warming trend is present.
- Warming is observed across all four seasons.
- The entire temperature distribution has shifted, leading to a near-total reversal of extremes: cold is rare, heat is common.
- The growing season is measurably longer and warmer.



The Precipitation Finding (Null Result)

- No clear long-term trend in total annual precipitation was found.
- The defining characteristic is high variability from one year to the next.

The 70-Year Story of St. John's Climate: A Fundamental Shift

The evidence is conclusive. The climate at St. John's is not just fluctuating; it has undergone a fundamental transformation over the last 70 years, moving from a colder past to a demonstrably warmer present.



Steadily Warmer



Extremes Have
Flipped



Longer Growing
Seasons



Precipitation
Remains Variable