Climate Change and Animal Health in Cyprus:

New Risks and Regional Solutions

Anastasios Matsikaris, PhD
Physicist, Meteorological Officer
Department of Meteorology

18th Conference of the Regional Commission for the Middle East, Larnaca, 26 November 2025

Global Climate Change

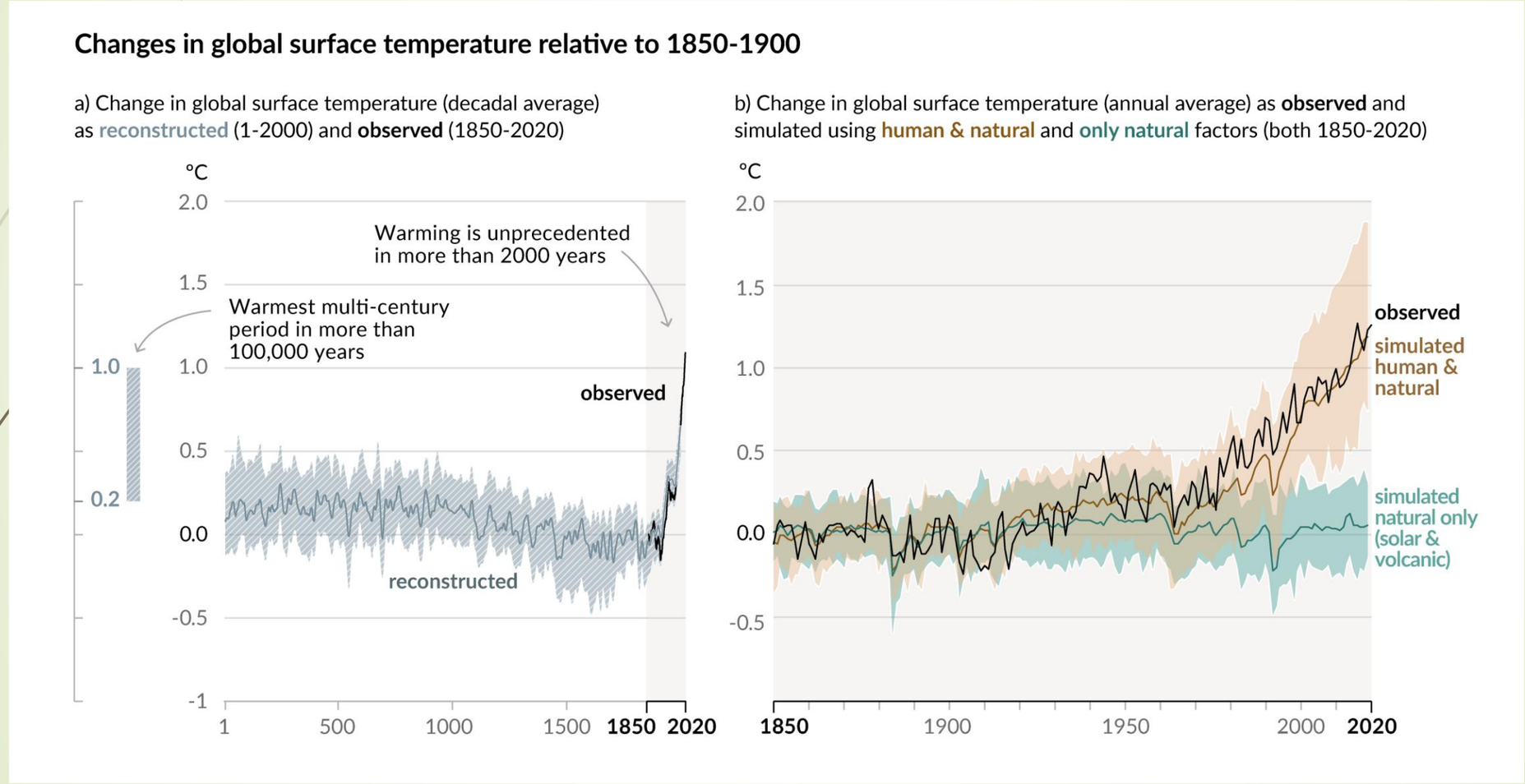
- ‘Recent changes in the climate are widespread, rapid, intensifying, and unprecedented in thousands of years’.

  IPCC SIXTH ASSESSMENT REPORT

- Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years.

- Unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to 1.5 °C will be beyond reach.

Global Climate Change

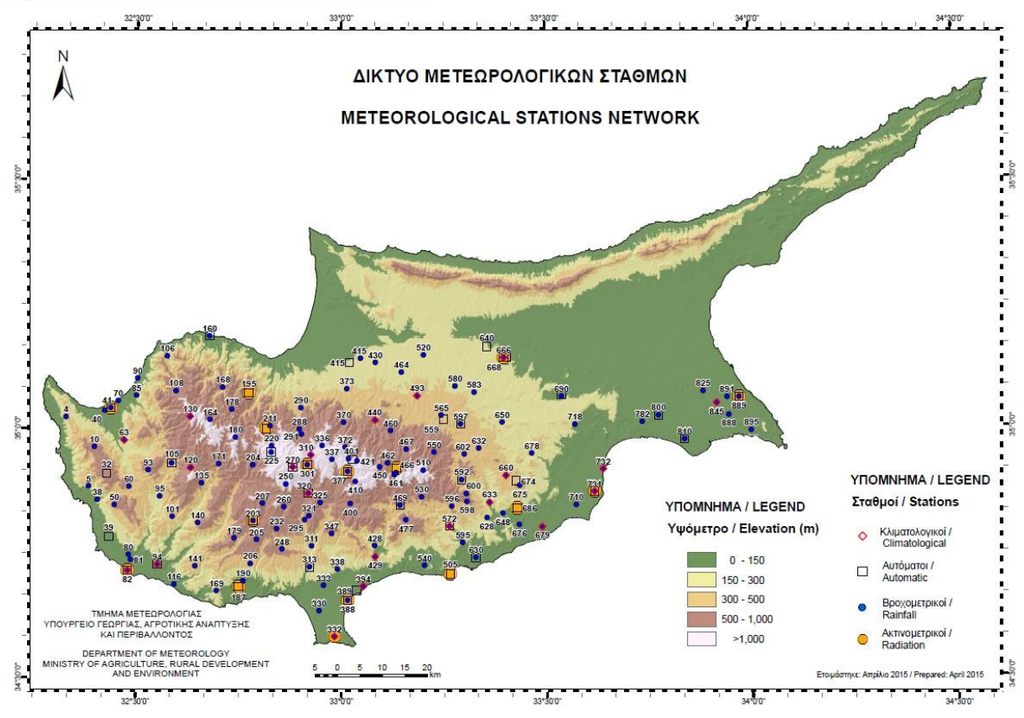


IPCC AR6 WG1

Global Climate Change

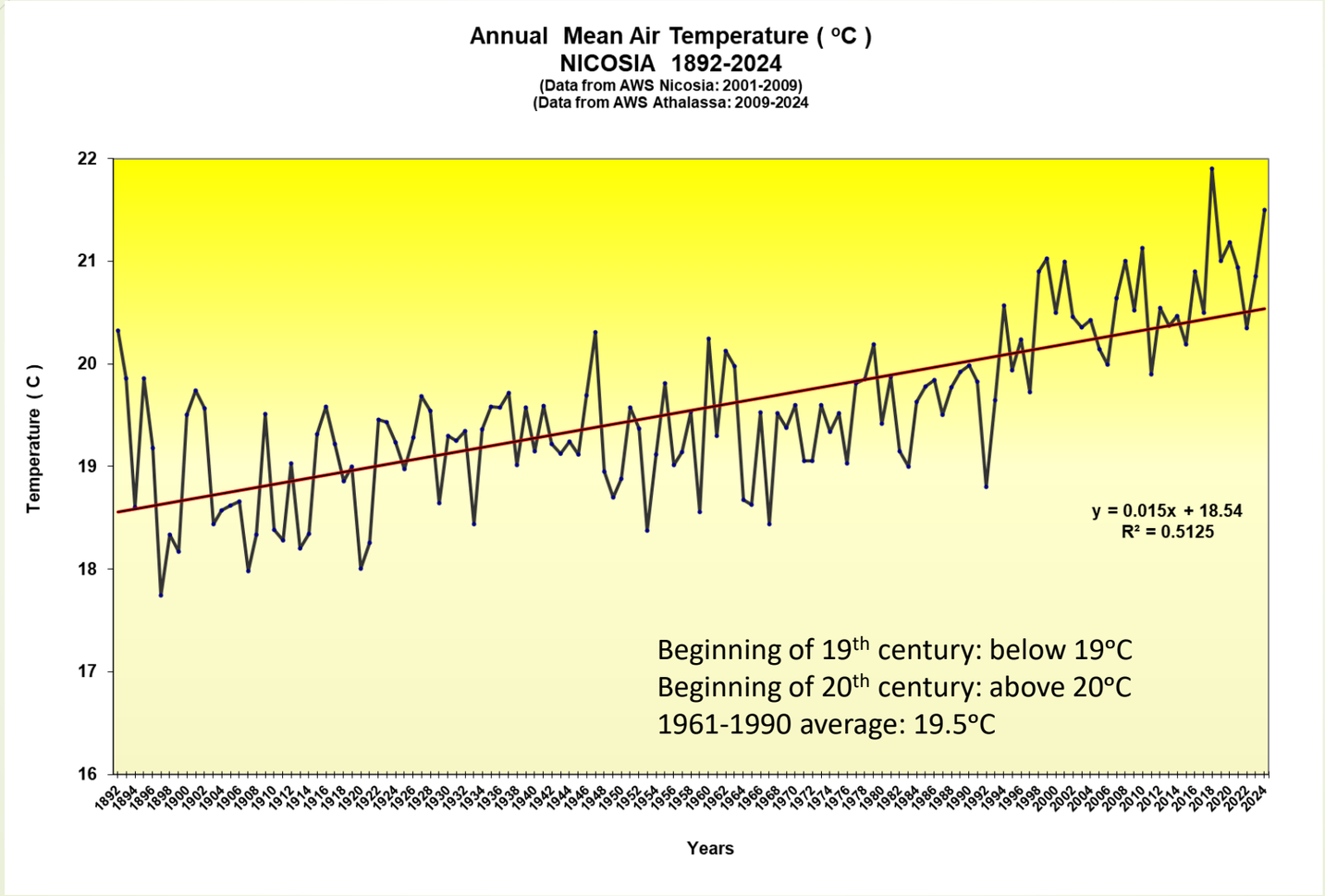
- Climate change is already affecting every region on Earth, in multiple ways. The changes we experience will increase with further warming.
- Indisputable that human activities are causing climate change, making extreme climate events, including heat waves, heavy rainfall, and droughts, more frequent and severe.
- There's no going back from some changes in the climate system. However, some changes could be slowed and others could be stopped by limiting warming.
- Strong, rapid, and sustained reductions in CO2, methane, and other greenhouse gases are necessary to limit global warming: reduce the consequences of climate change but also improve air quality.

Climate change observations in Cyprus

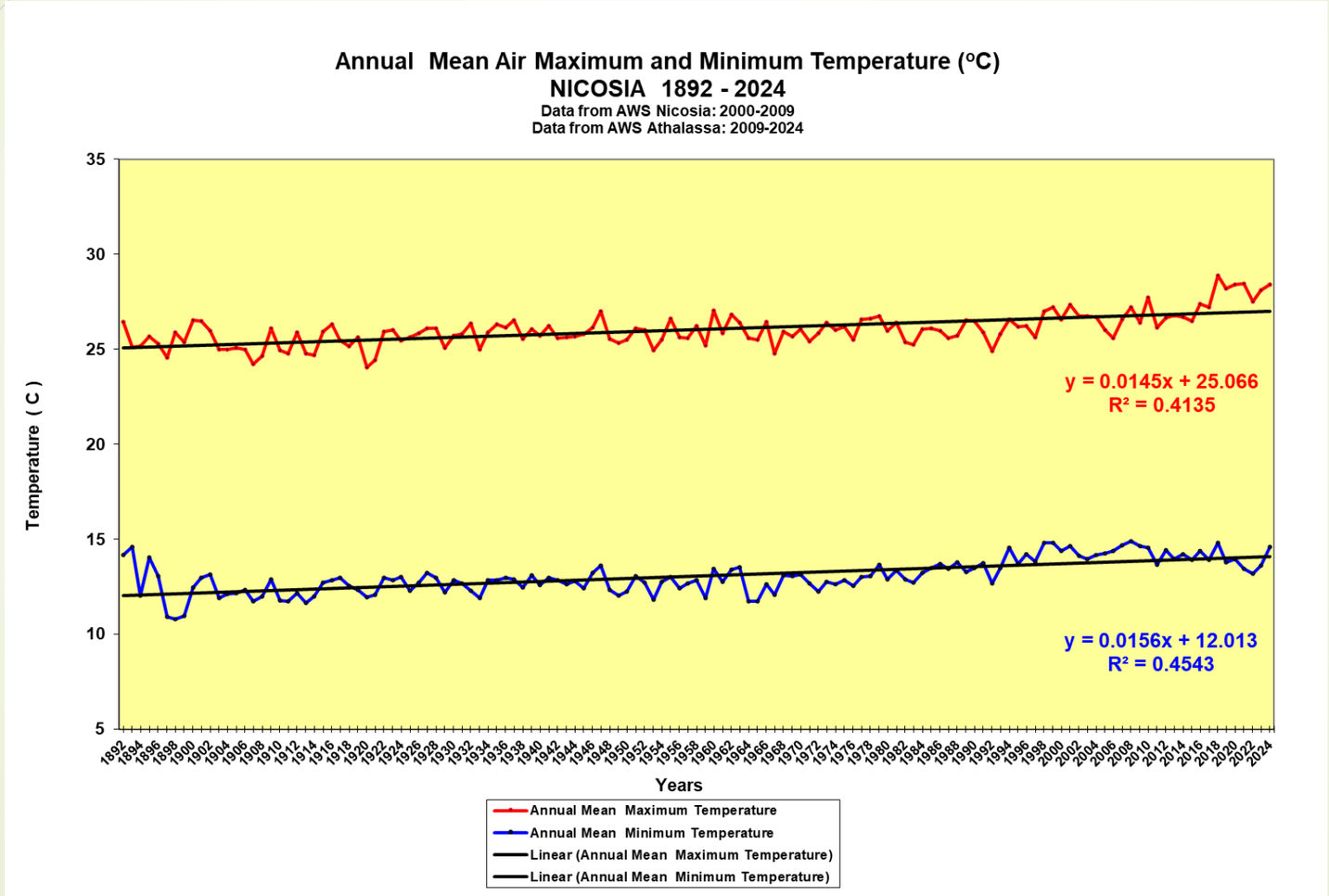


- Both temperature and cumulative precipitation are measured by the network of stations maintained by the Meteorology Department.
- Due to the large time series of data, conclusions about the distribution of these key climatic indicators can be exported.
- More than 55 automated stations

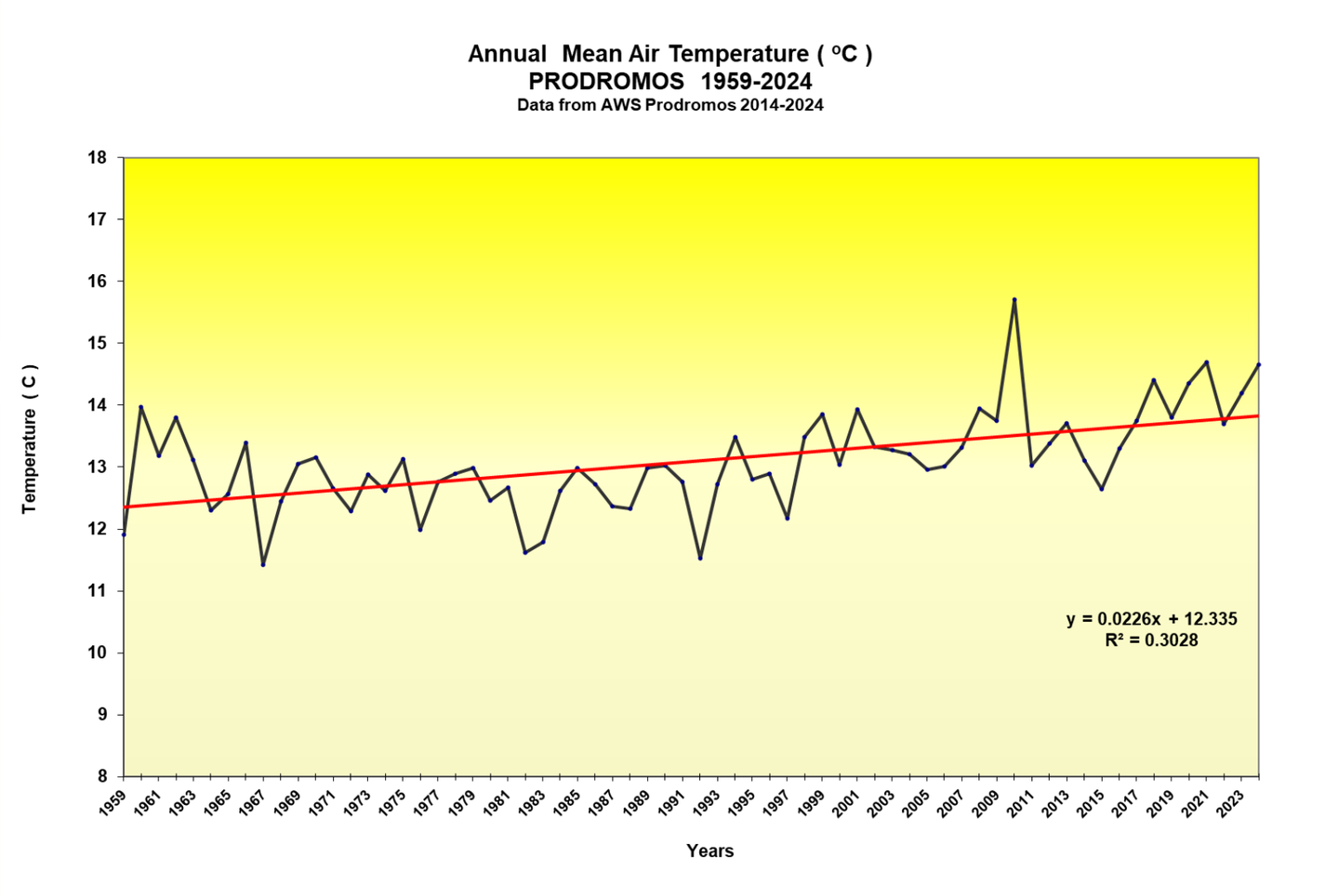
Climate change observations in Cyprus: Temperature



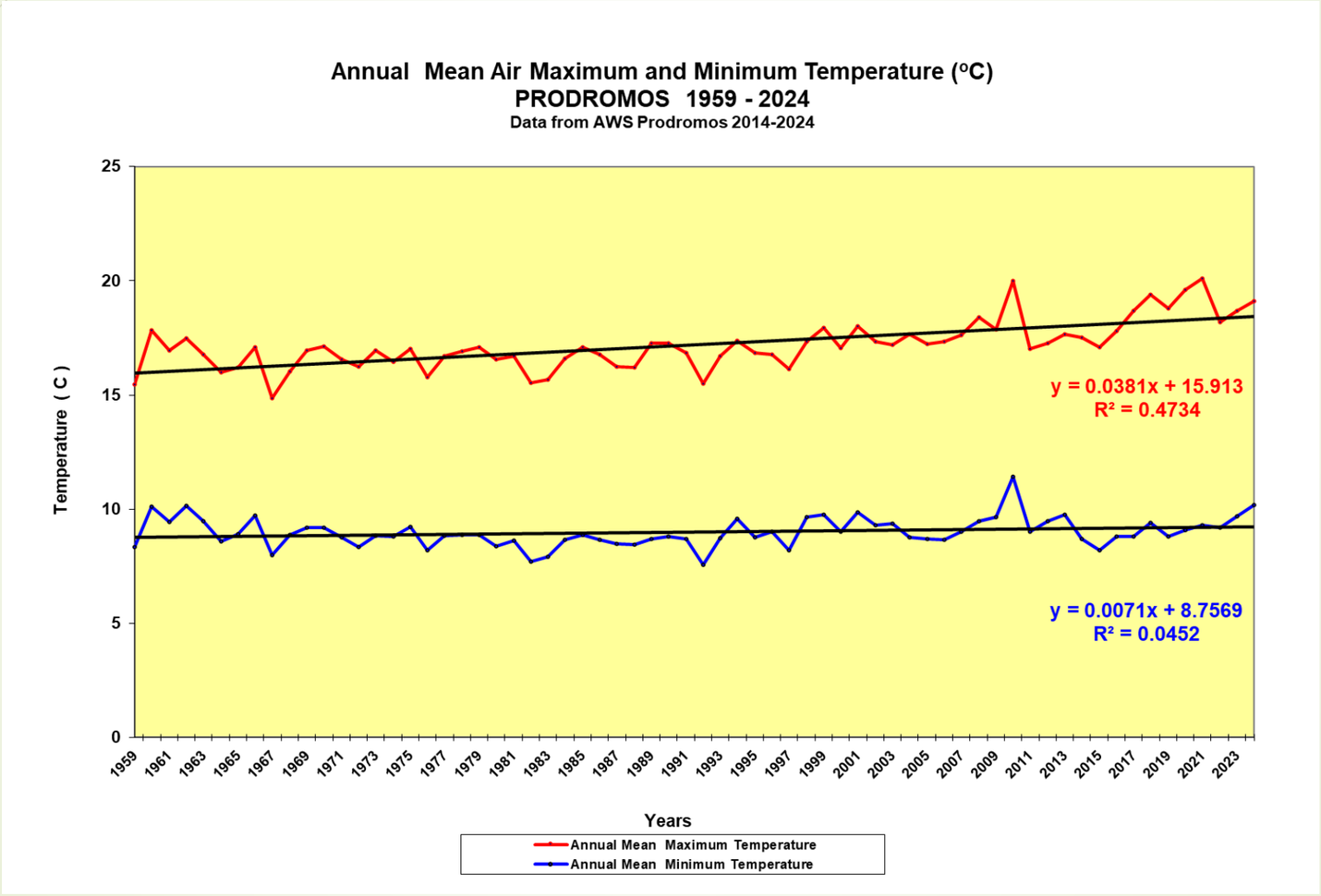
Climate change observations in Cyprus: Temperature



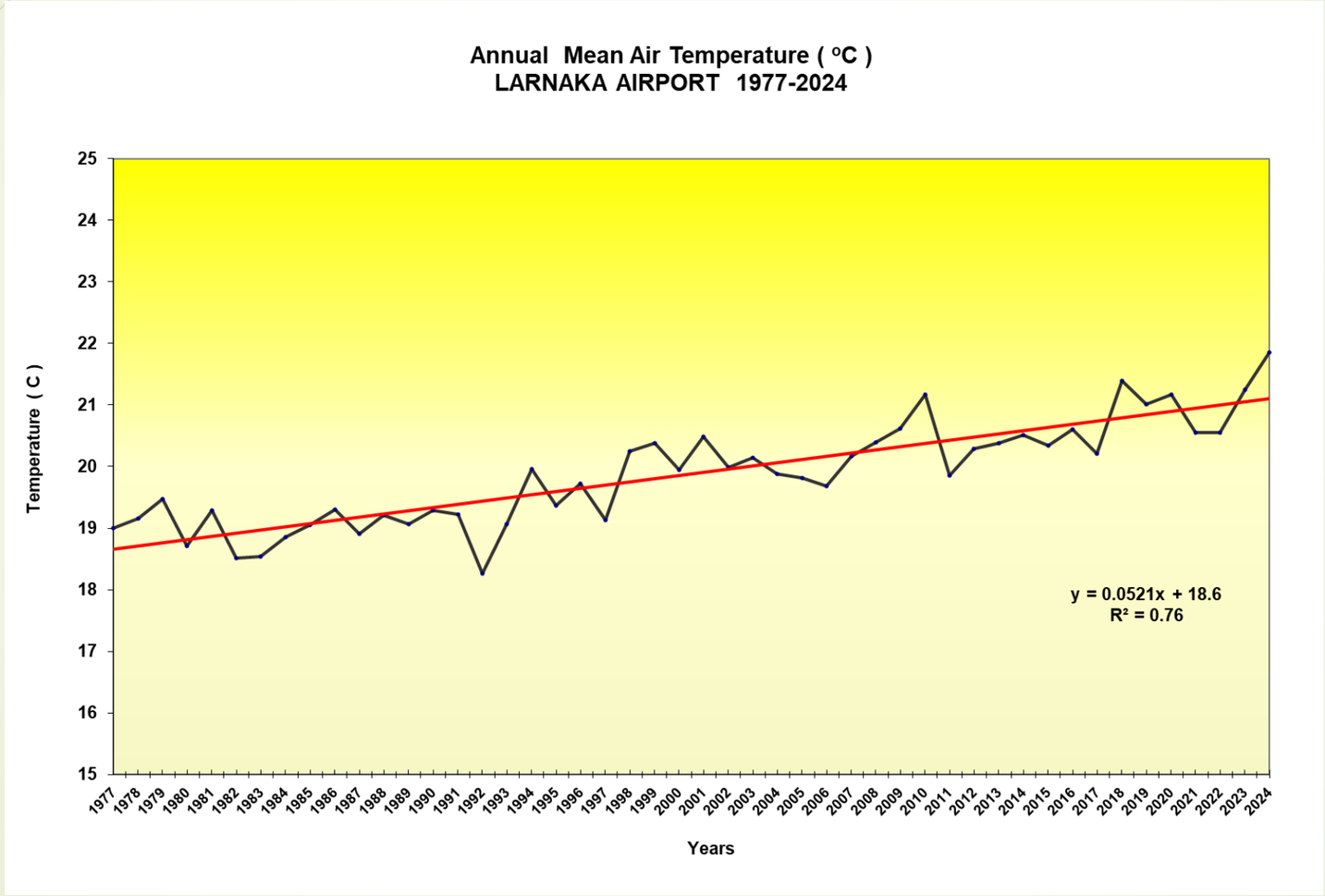
Climate change observations in Cyprus: Temperature



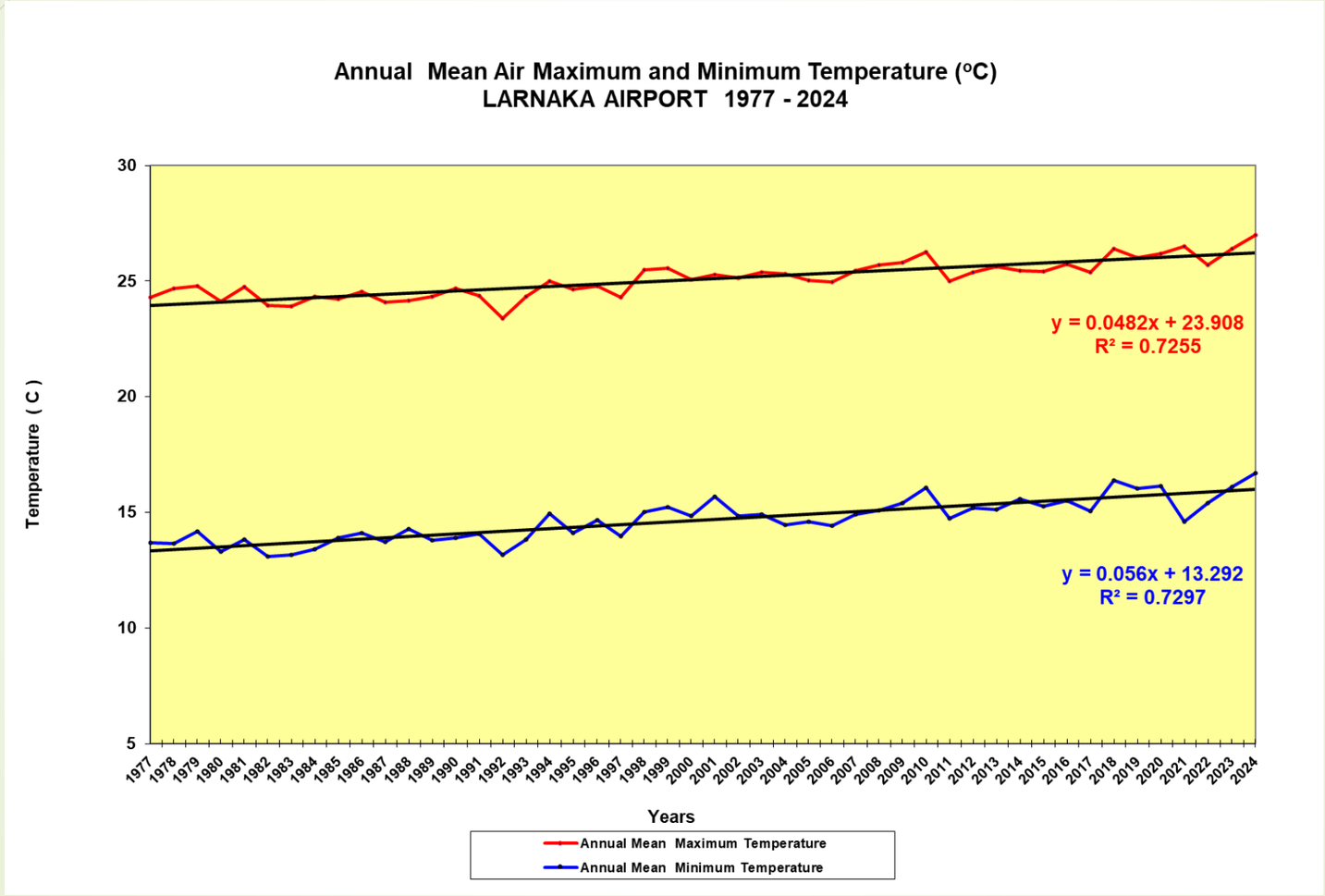
Climate change observations in Cyprus: Temperature



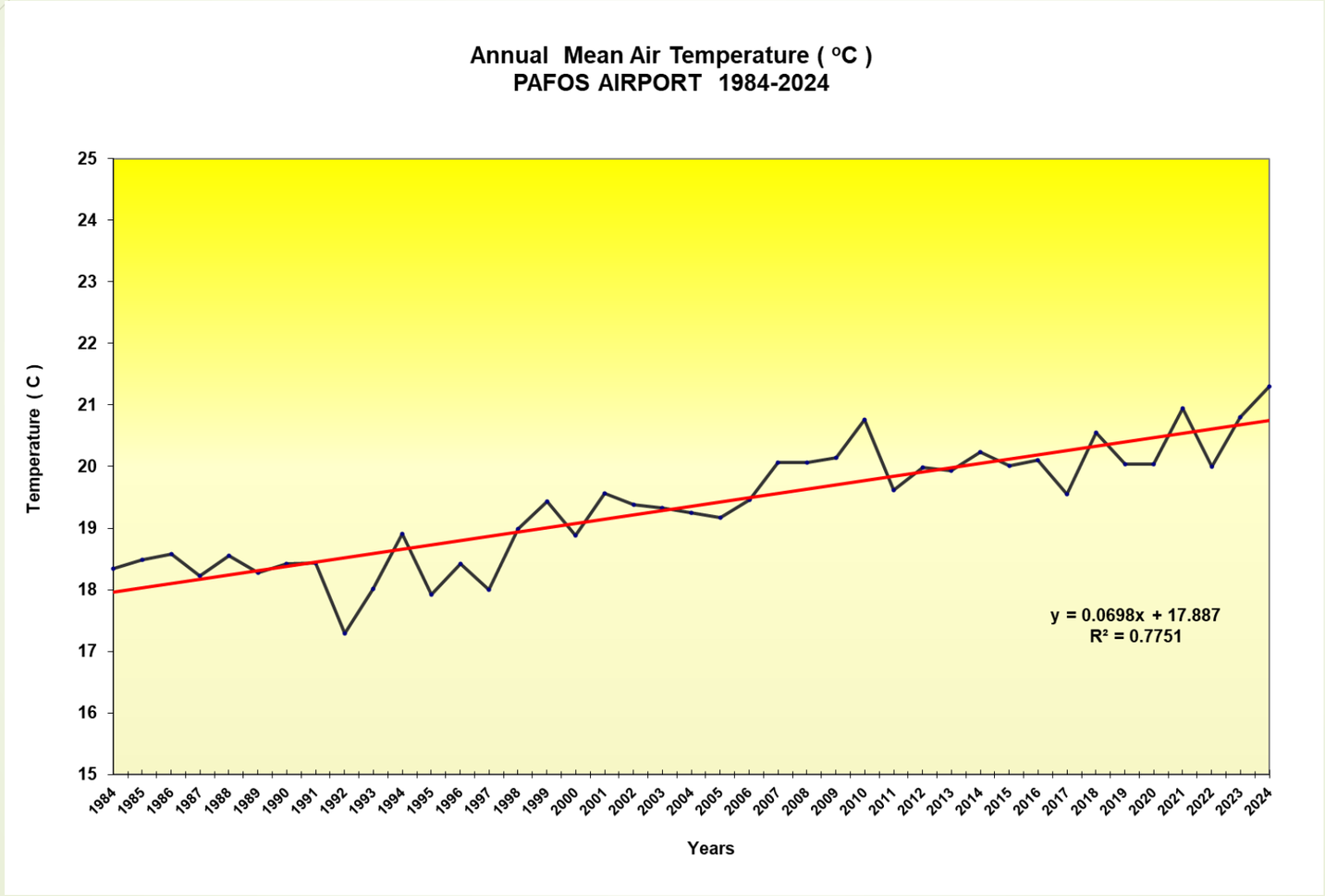
Climate change observations in Cyprus: Temperature



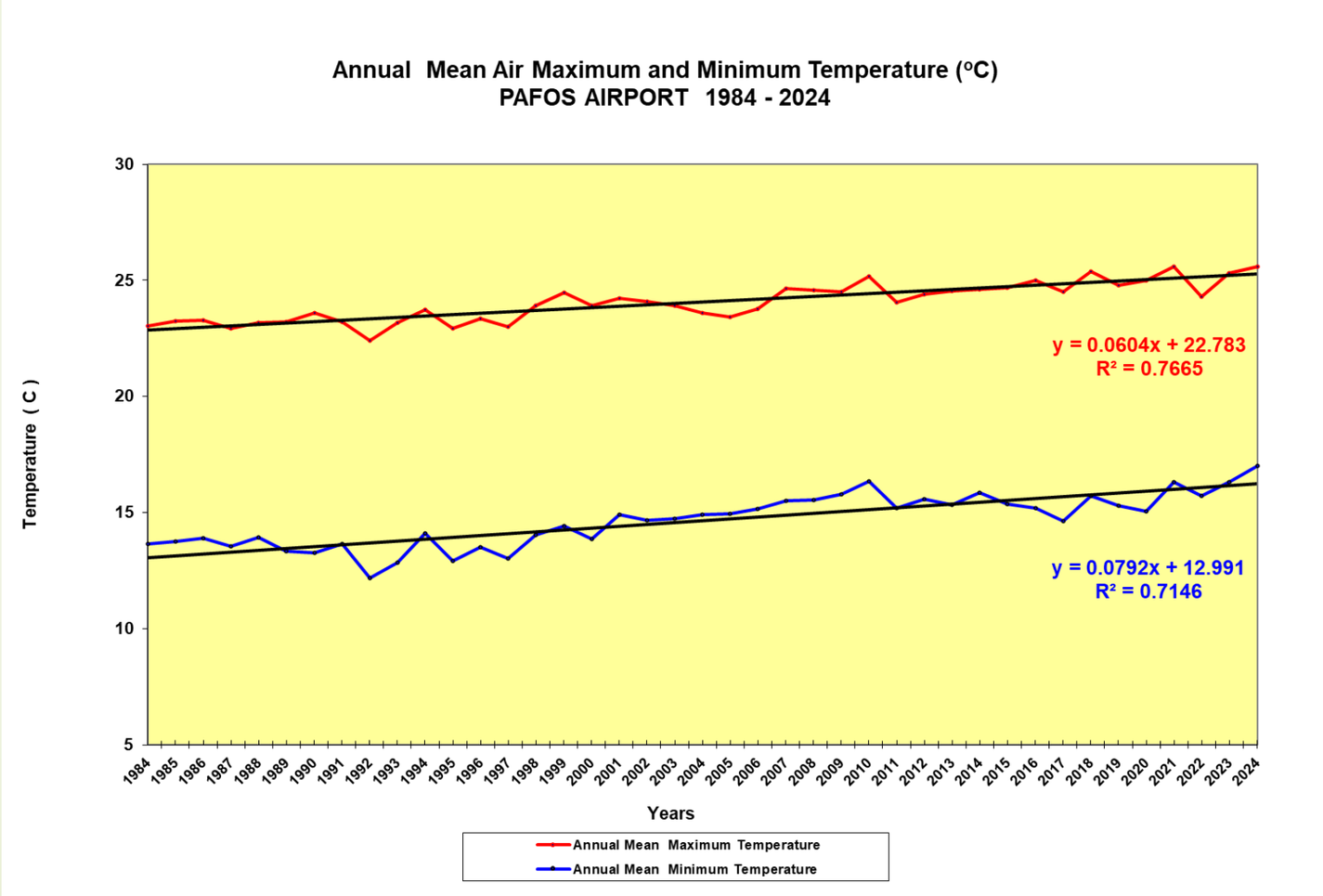
Climate change observations in Cyprus: Temperature



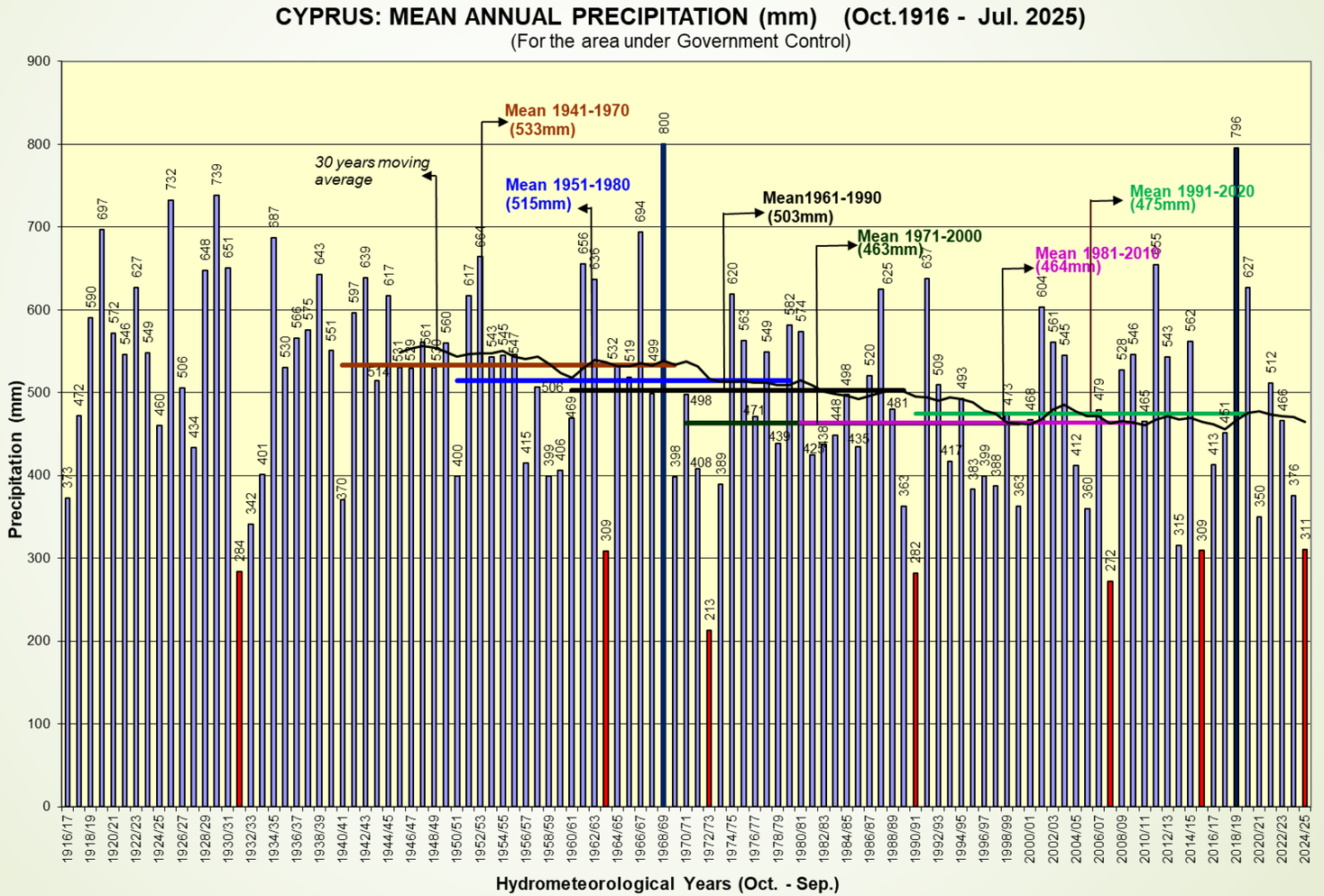
Climate change observations in Cyprus: Temperature



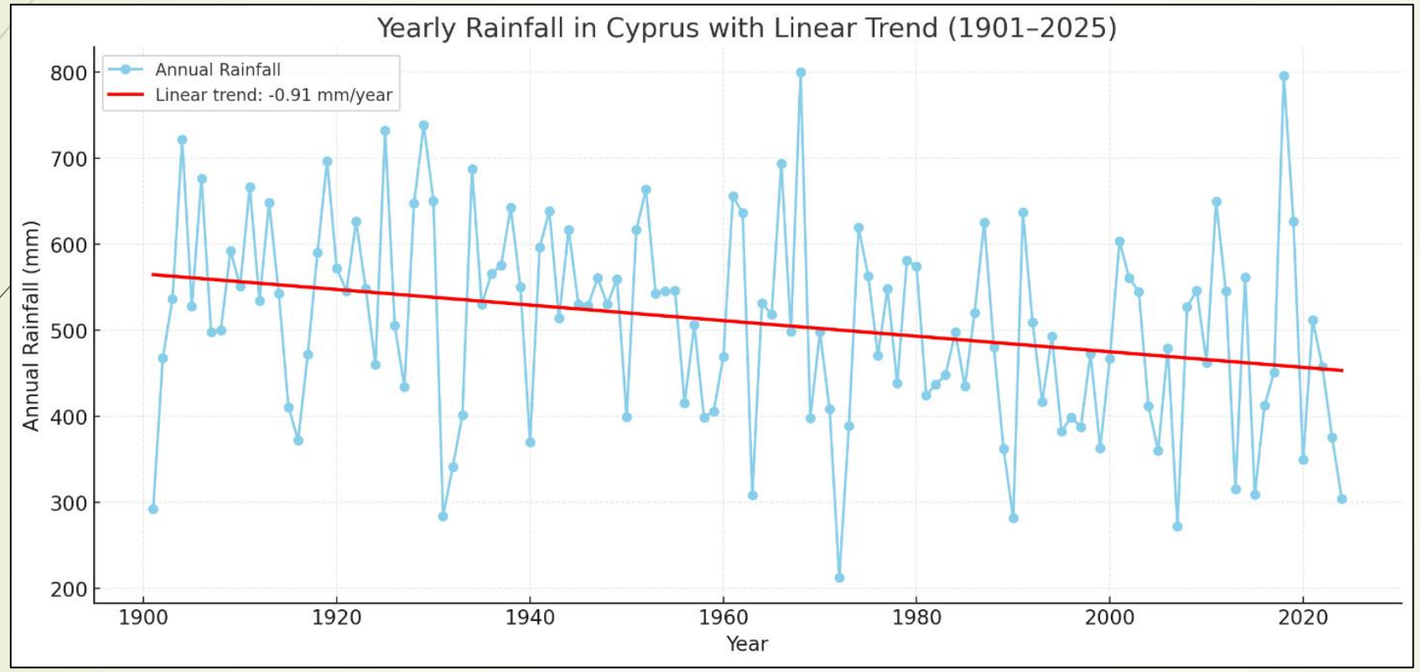
Climate change observations in Cyprus: Temperature



Climate change observations in Cyprus: Precipitation



Climate change observations in Cyprus: Precipitation



Climate change observations in Cyprus: Precipitation

- Average Annual Rainfall of the period 1901-1930: 559 mm.
- Average Annual Rainfall of the period 1971-2000: 463 mm.

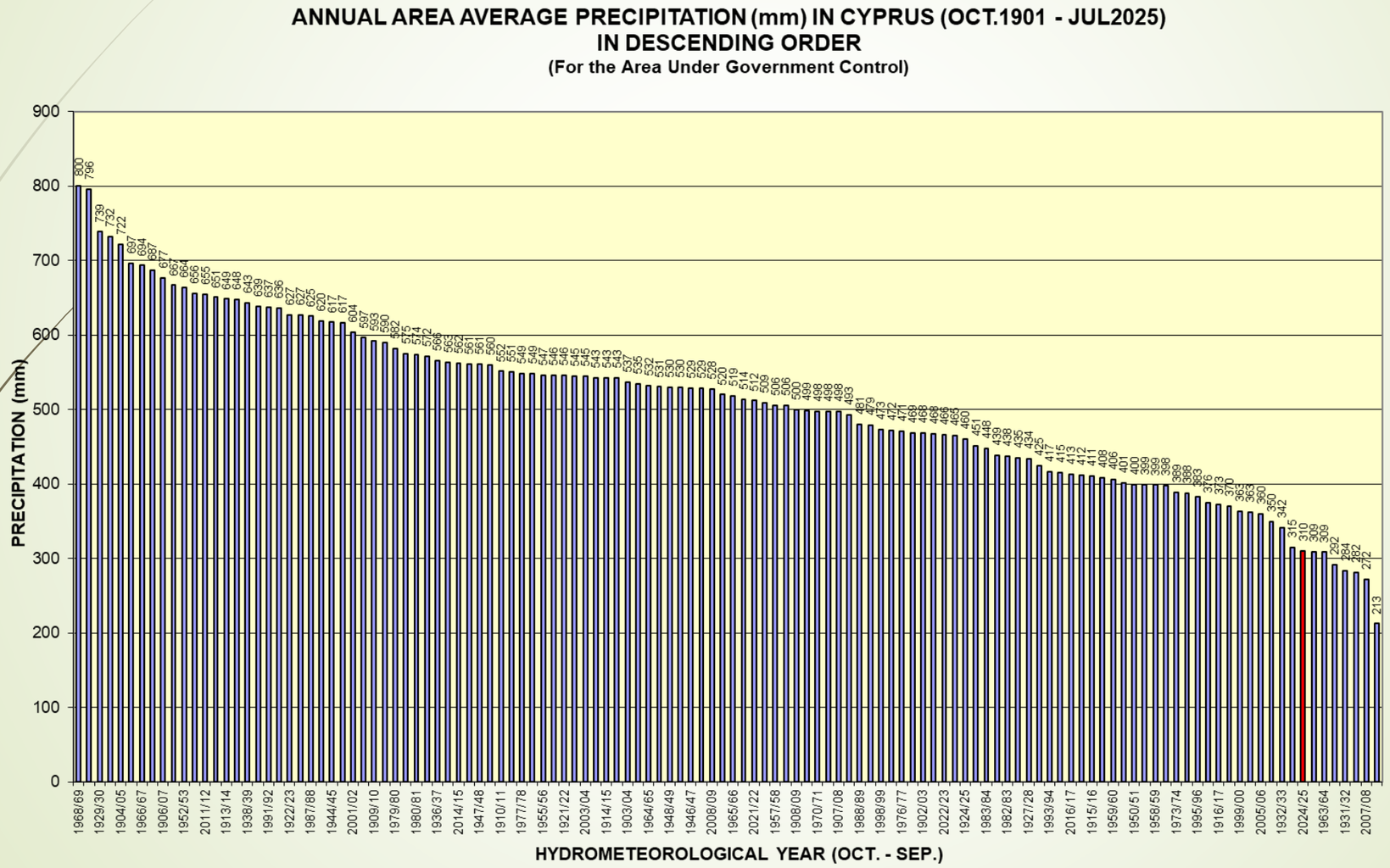
- Reduction of precipitation by about 100 mm or 17% compared to the first thirty years.

- Rain statistics from representative stations for the period 2011-2020, show an increase in precipitation in the coastal areas, apart from the northwest, over the last decade. There is also an increase in the interior and in the northern mountainous and semi-mountainous areas (possibly due to the increase in instability caused by high temperatures).

- In the south-southwest mountains and semi-mountains, there is a decrease in rainfall compared to the normal (possibly due to the reduction of rain systems).

- The models predict a further reduction in precipitation.

Climate change observations in Cyprus: Precipitation



Future Climate Change

- Future emissions cause additional warming. Total warming is dominated by past and future CO2 emissions.
- With every increment of global warming, changes get larger in regional mean temperature, precipitation and soil moisture.
- Extreme rainfall intensifies by 7% for each additional 1°C.
- With warmer temperature the atmosphere can hold more water ⟶ More and faster evaporation ⟶ Heavier precipitation.

Climate Projections: Cyprus

- Models for the Eastern Mediterranean and specifically Cyprus predict a further increase in the mean temperature and a decrease of the precipitation.
- Extreme weather events (droughts, floods, heatwaves, etc.) are expected to increase their frequency of appearance.
- High temperatures and heavy rains on the ground cause Desertification, i.e., gradual loss of soil productivity.
- The future climate in Nicosia is expected to resemble that of Cairo.

Climate Challenges: Cyprus

Concerns about future implications:

- Ecosystems and biodiversity, quality of forests, flora and fauna (e.g., migration of pines to higher altitudes).
- Reduction of the germination period, production reduction, reduction of animal production (heat waves, high temperatures).
- Lessepsian fish invasion in Mediterranean marine protected areas (Lagocephalus, lionfish, etc.).
- Forest fires as a result of climate change (e.g., the 2021 fire in Arakapas as a result of unusually high temperatures and low RH).

Climate Challenges: Cyprus

Concerns about future implications:

- Impact on the tourism industry.
- Energy production.
- Drinking water.
- Societal impacts.
- Political impacts, relations among countries.
- Various other financial impacts.

Climate Change: How it Affects Animal Health

Heat Stress Effects

Hot weather reduces how much livestock produce. It also harms their ability to have offspring and weakens their immune system. Animals eat less, make less milk, and get sick more easily.

New Diseases Appearing

Climate change helps diseases like bluetongue, West Nile virus, and tick-borne infections spread. Warmer winters mean insects that carry these diseases can live all year, reaching new areas.

New Mosquito Threat

The Aedes aegypti mosquito has recently been found in Cyprus. This new species can spread many viruses. These diseases can harm both animals and people.

Vector-Borne Diseases: A Growing Threat in the Eastern Mediterranean

1. ## Early 2000s: Bluetongue Virus Appears

   Bluetongue Virus (BTV) spread widely among farm animals in the Eastern Mediterranean. This greatly affected farming and food supplies. Changes in climate and how insects spread the virus led to more disease.

2. ## Mid-2000s: West Nile Virus Spreads

   West Nile Virus (WNV) repeatedly caused illness in people and horses. This showed the virus was established in the region and could cause serious brain problems. Monitoring increased, but difficulties remain.

3. ## 2010s Onward: Crimean-Congo Fever Increases

   Crimean-Congo Hemorrhagic Fever (CCHF) became more common and spread to new areas. This was because warmer weather and changing animal movements affected tick numbers.

4. ## Late 2010s - Present: New Mosquito Species Arrive

   New mosquito species, like Aedes aegypti, have been found and are now living in parts of the Eastern Mediterranean where they weren't before. This raises fears that new viruses, such as Dengue and Zika, could spread in areas that haven't had them.

Livestock Adaptation Strategies in Cyprus: Mitigating Climate Change Impacts

Effective strategies are crucial for safeguarding animal health and productivity in Cyprus amidst evolving climatic conditions.

Advanced Housing Systems

Implementation of passive cooling designs, such as high-insulation roofing and strategic ventilation, alongside active systems like evaporative coolers, has been observed in Cypriot livestock farms to mitigate heat stress. Shaded areas and misting systems further enhance thermal comfort and animal welfare.

Optimized Water Management

Ensuring continuous access to cool, potable water is paramount. Technologies like automated water delivery systems, coupled with efficient irrigation methods for fodder cultivation (e.g., drip irrigation), are critical for maintaining hydration and supporting feed production.

Genetic Selection and Breeding Programs

Selective breeding initiatives, particularly in local breeds such as the indigenous Chios sheep and Damascus goats, prioritize thermotolerance traits. Genetic markers for heat resistance are being investigated to enhance resilience to elevated ambient temperatures.

Strategic Nutritional Interventions

Adjusting feeding schedules to cooler periods of the day and modifying dietary compositions with increased energy density or supplemental minerals can ameliorate physiological responses to heat stress, thereby optimizing feed intake and metabolic efficiency.

Collaborative efforts in the Eastern Mediterranean

Animal diseases and climate change impact many countries. Collaborative efforts in the Eastern Mediterranean are essential to build strong defenses.

Cross-Border Surveillance

Information sharing systems and monitoring of animal health across countries enable prompt detection and rapid containment of disease outbreaks.

Collaborative Research Initiatives

Joint research efforts facilitate a deeper understanding of climate change impacts, disease epidemiology, and causative factors. These findings inform strategic actions.

Standardized Health Regulations

Adherence to uniform health rules and practices improves disease prevention and control, additionally ensuring high standards of animal welfare.

European Union Support

The European Union provides funding and guidelines. This support enhances veterinary services and strengthens preparedness for climate change challenges.

Technology for Stronger Animal Health

New technology offers strong tools to lower climate risks and improve animal health.

Smart Farming

Managing resources and crops better to grow strong feed for animals.

Smart Sensors

Tracking animal health, behavior, and environment as it happens.

AI Forecasts

Predicting outbreaks of disease and finding at-risk animals early.

Quick Tests on the Go

Detecting disease and collecting data fast on-site for quick action.

Thank you for your attention

Anastasios Matsikaris, PhD
Physicist, Meteorological Officer
Department of Meteorology