

# Look from the outside

Mutlu's perspective!

# My observations

- The region is characterized by change (the only thing that is constant in the region is change)
- Change occurs at different spatial and temporal scales
- Different countries but similar patterns of change
- Different countries but similar concerns (forest and grassland degradation, soil erosion, water resources, pollution, agricultural productivity etc.)
- There is great opportunity to study these changes (long history of observations, soviet legacy, new forms of observations and datasets)

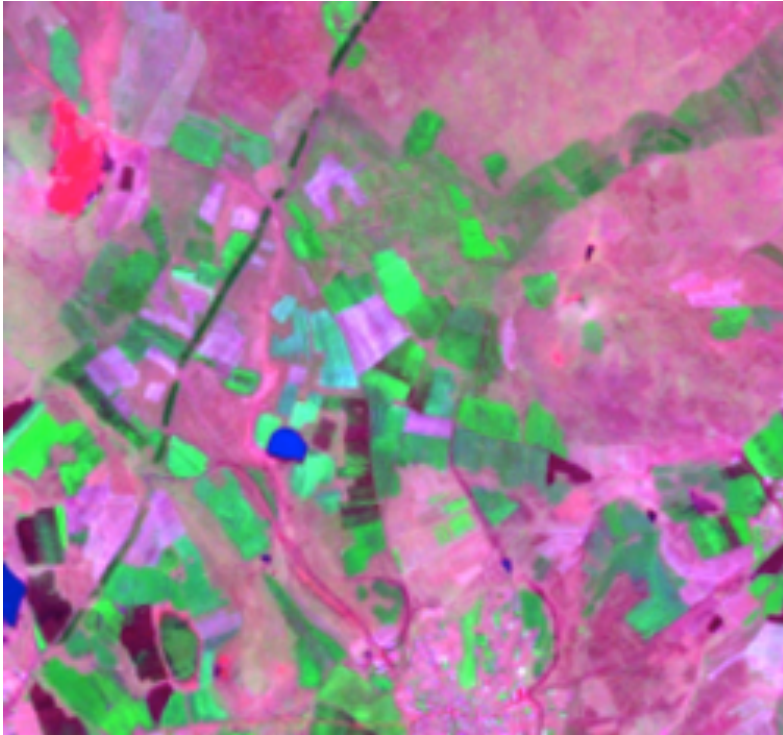
<http://www.freeworldmaps.net/asia/caucasus/caucasus-countries-hd.jpg>



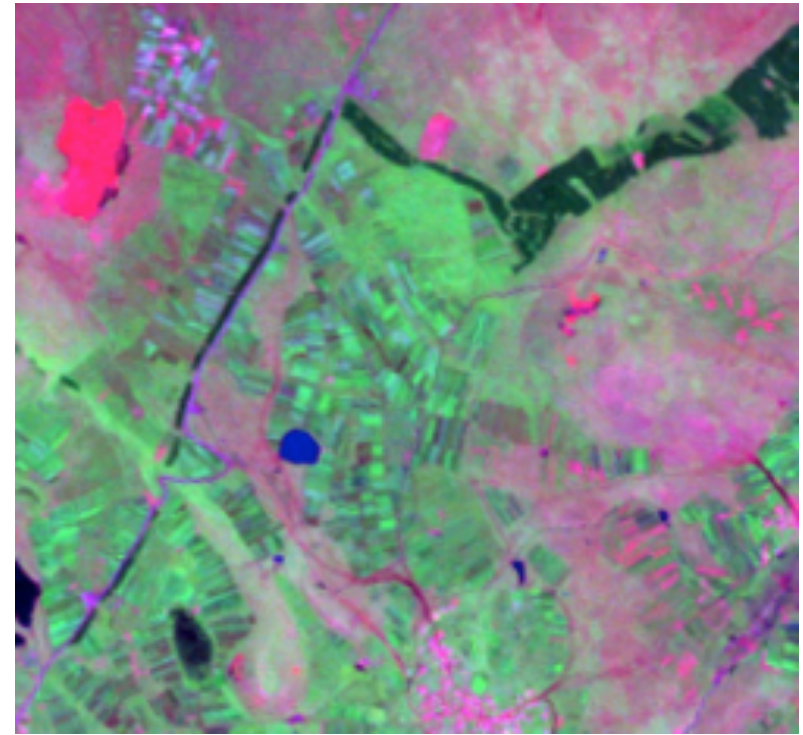
# land use

examples from Azerbaijan

# Changes in land use



1985

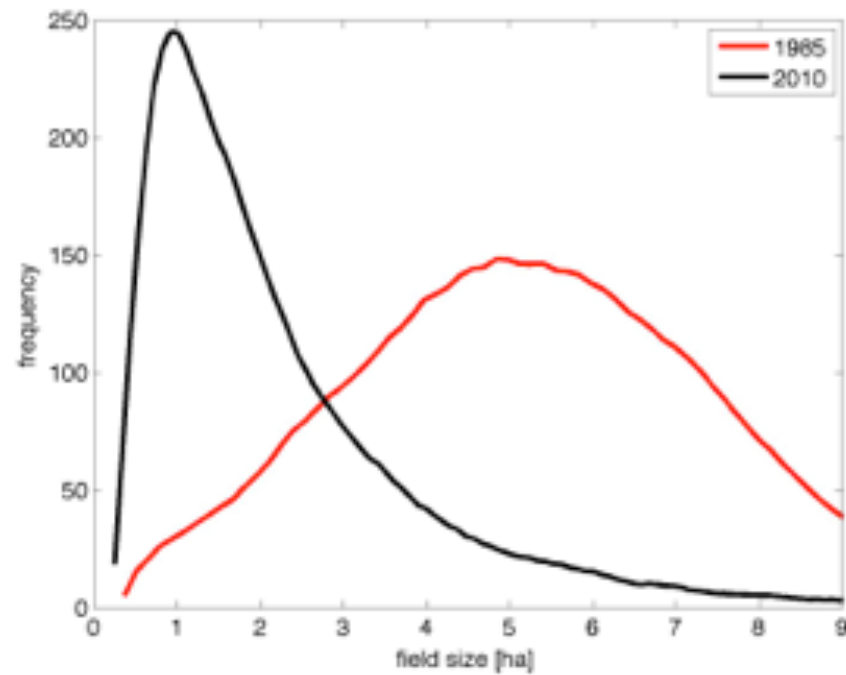


2011

Reduction in field sizes is one outcome of decentralization

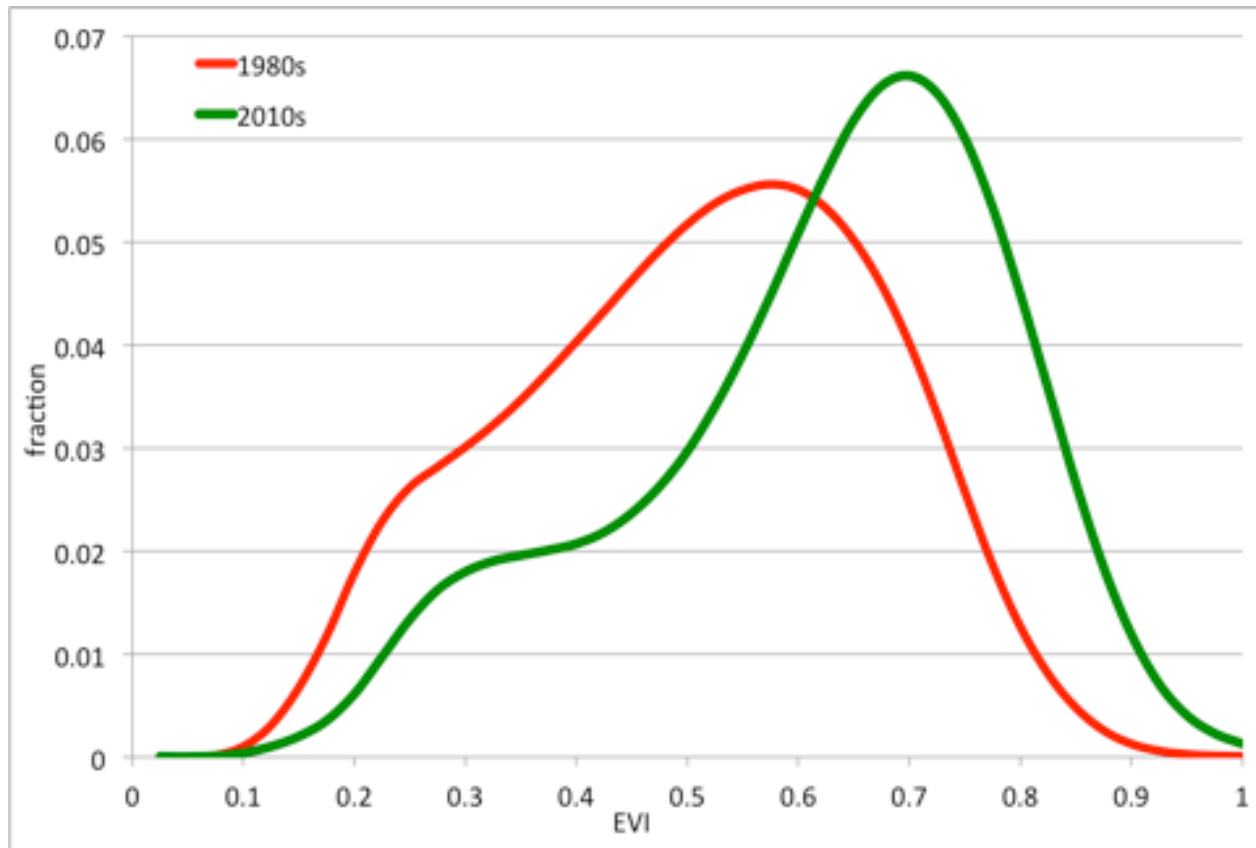
source: Landsat



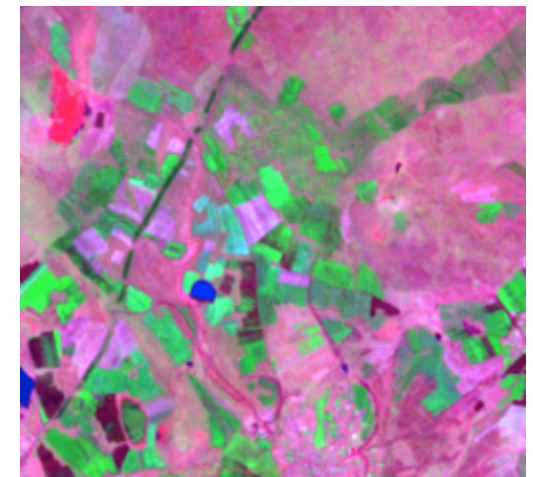


histogram distribution  
of field sizes

# changes in productivity



remote sensing  
based estimate  
of relative  
productivity

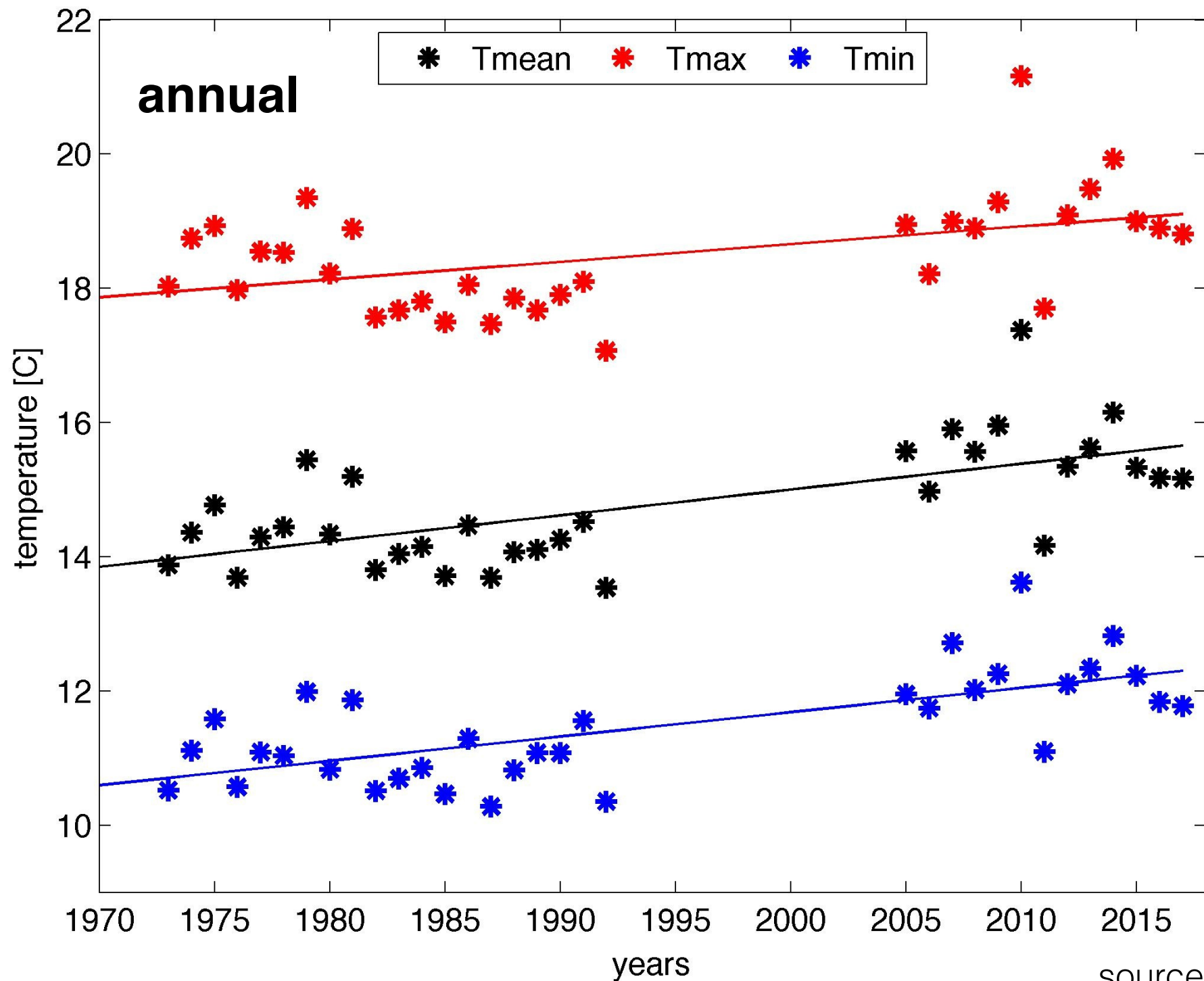


# Climate

examples from Georgia

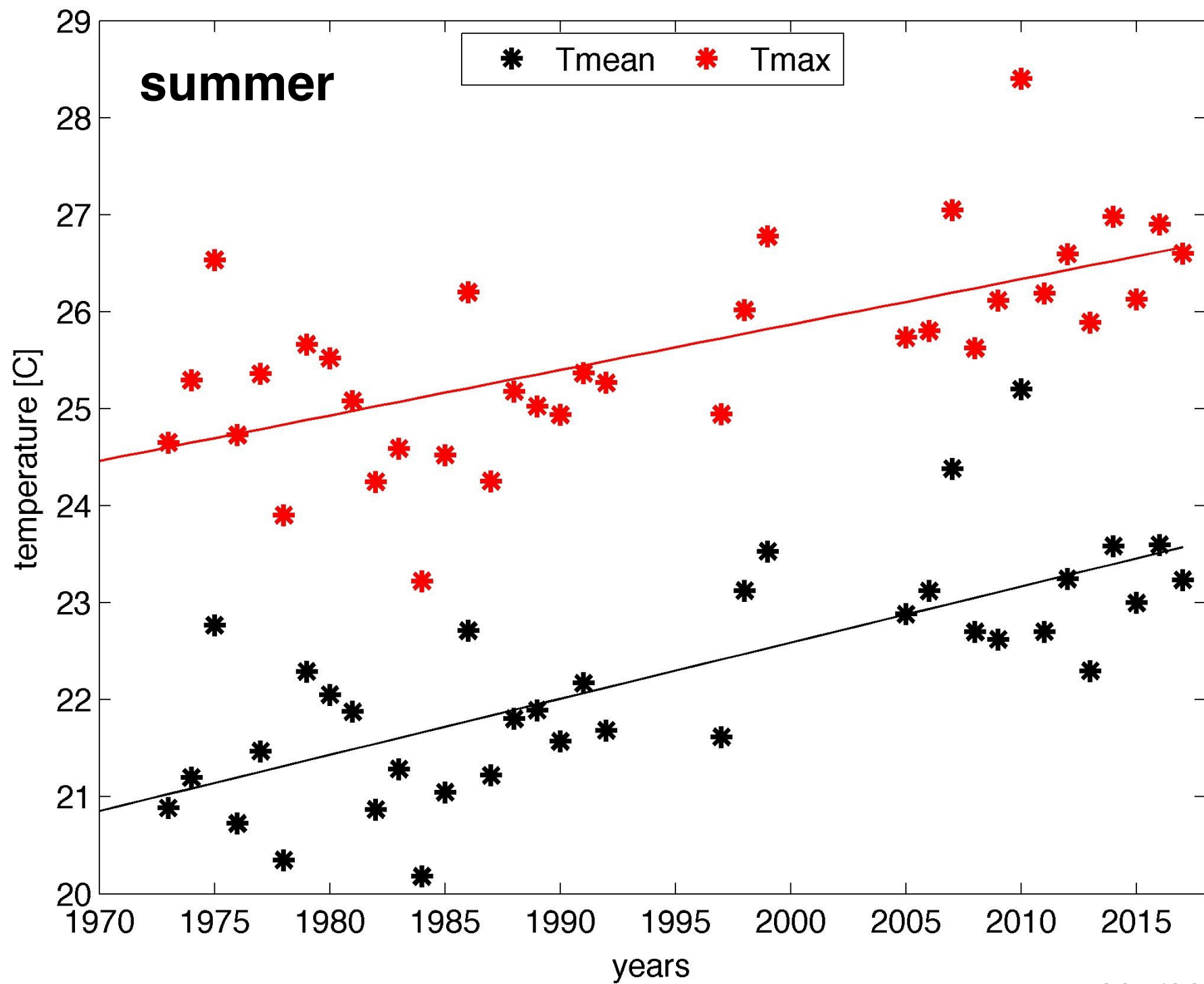


# Batumi



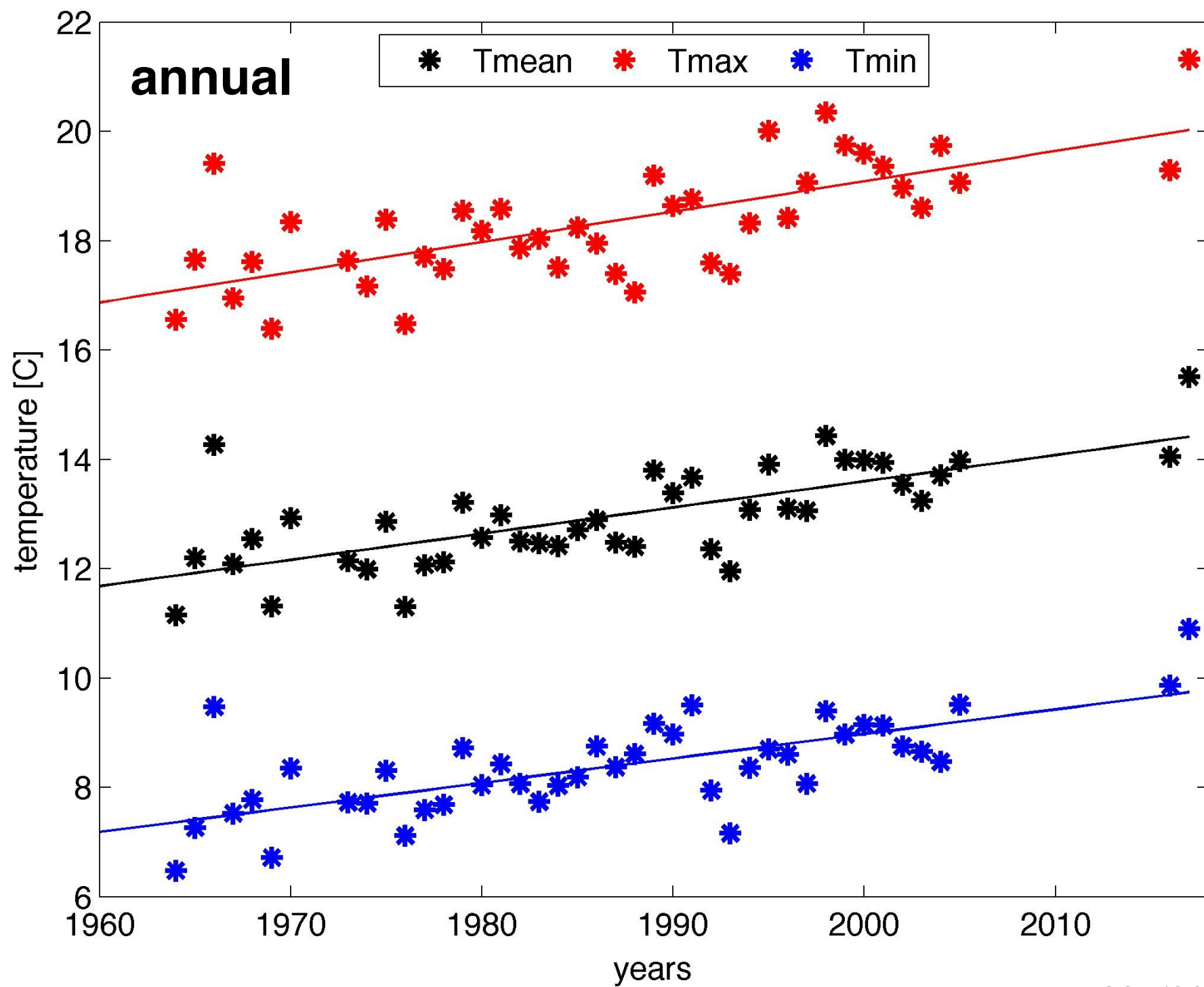
source: GSOD

# Batumi

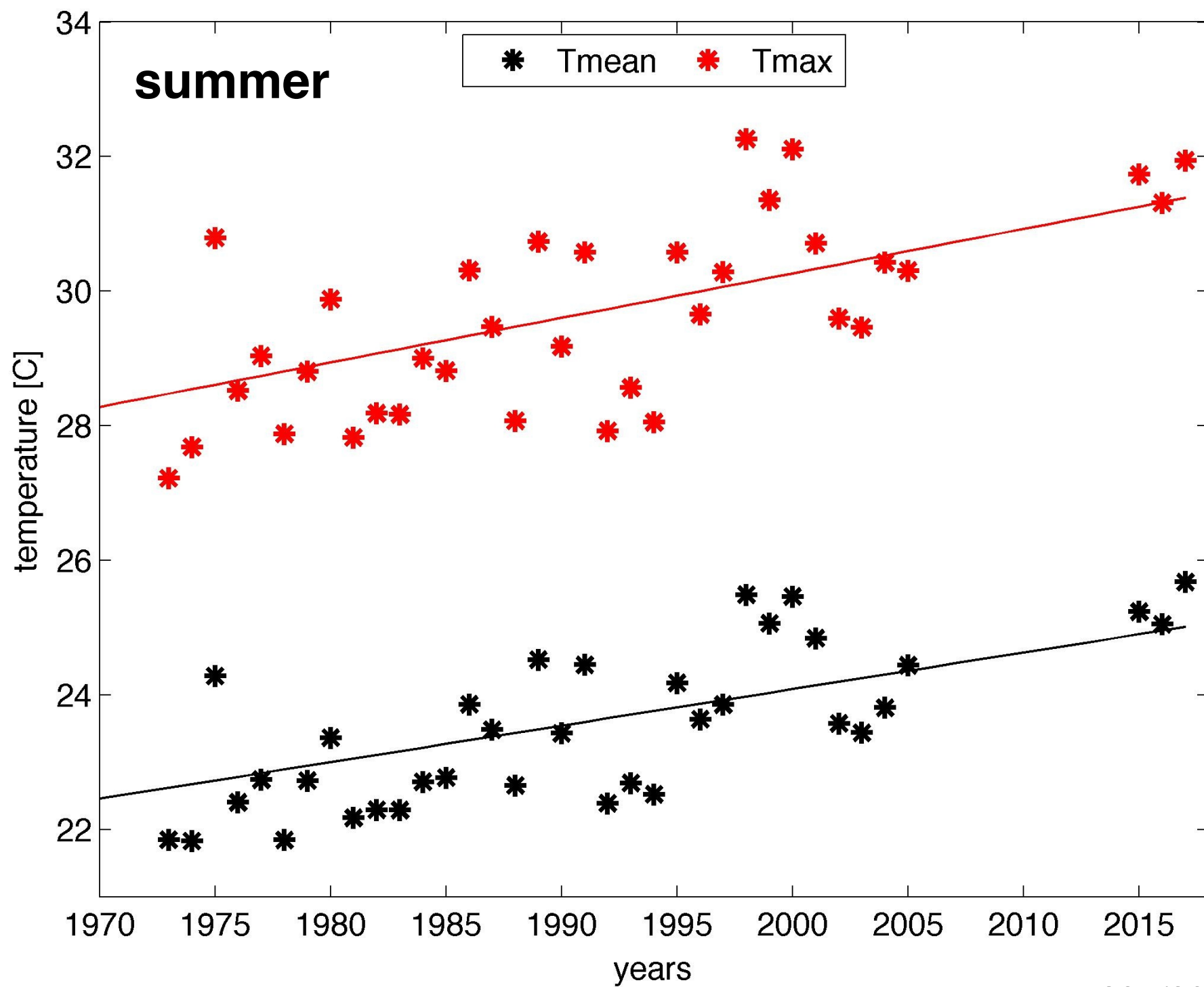


source: GSOD

# Tbilisi



# Tbilisi

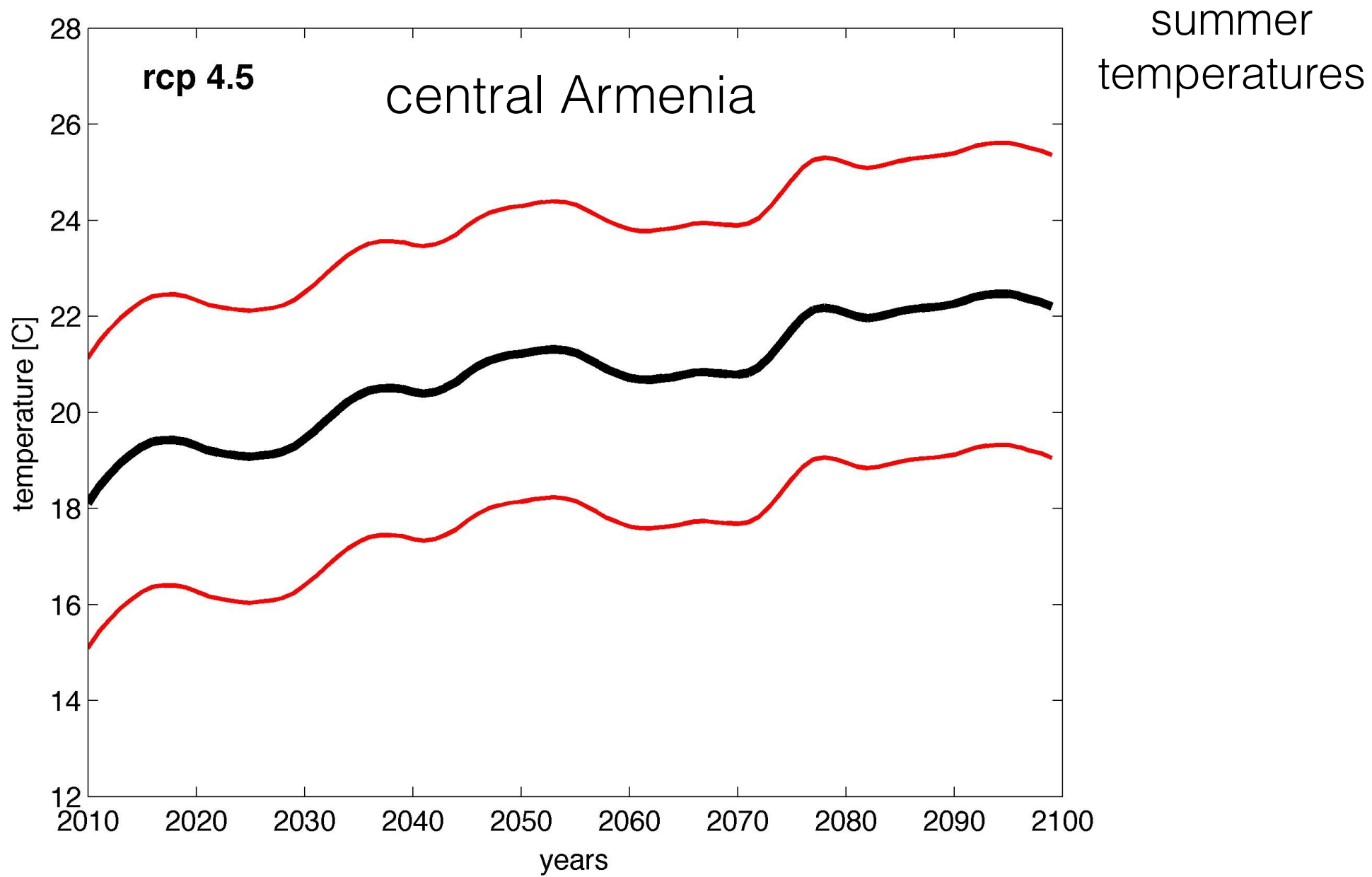


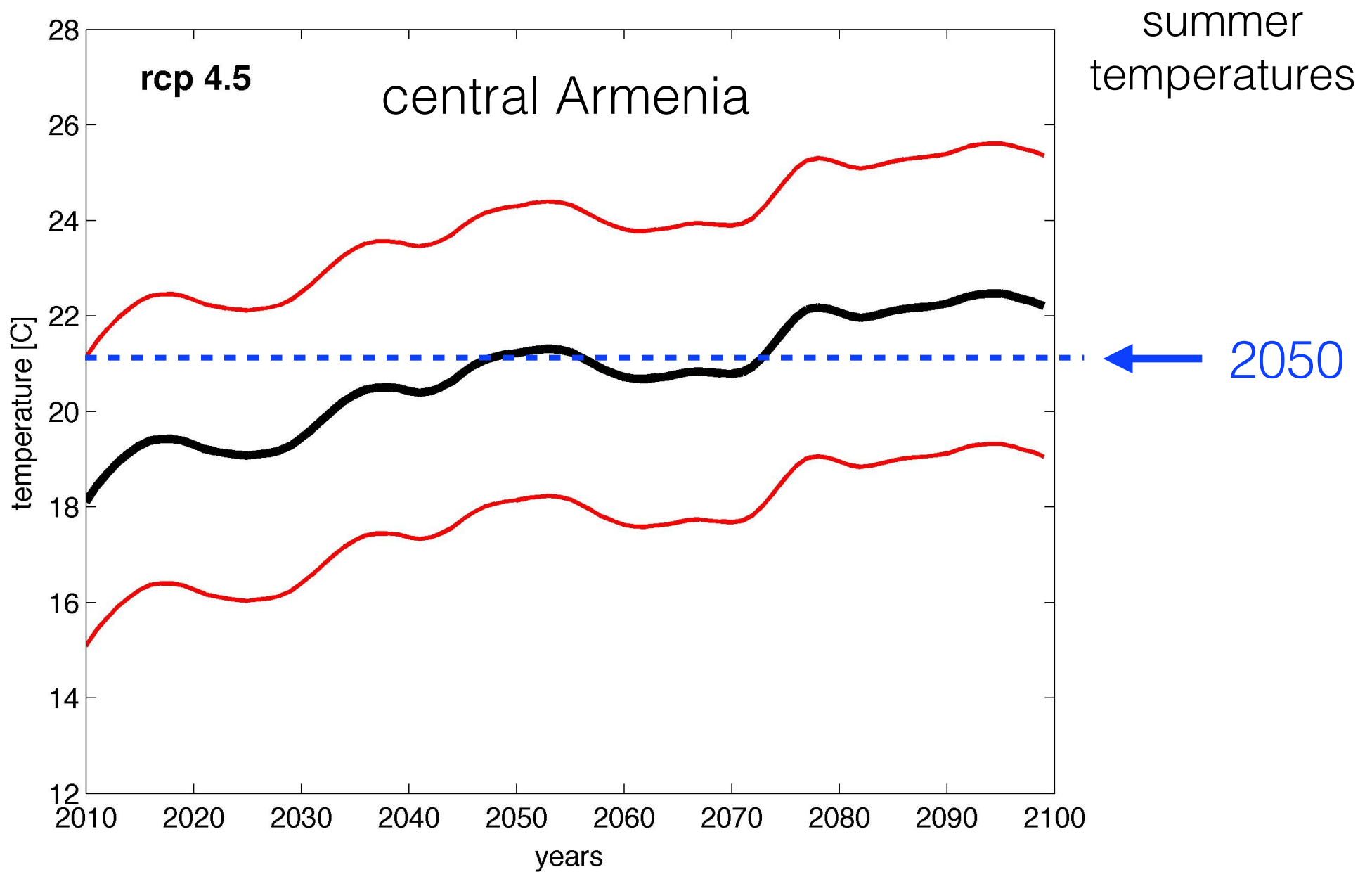
source: GSOD

# climate change

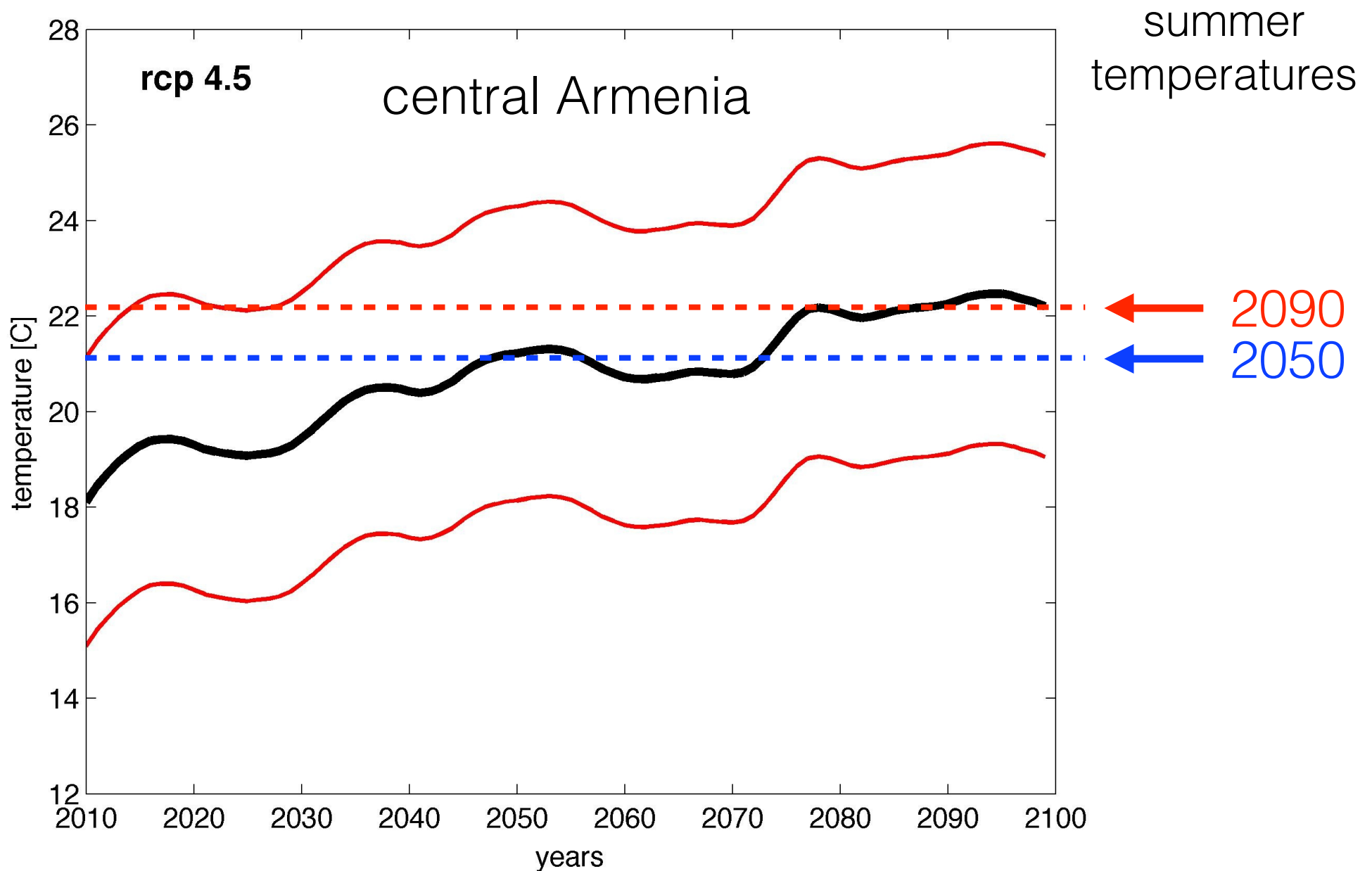
examples from Armenia





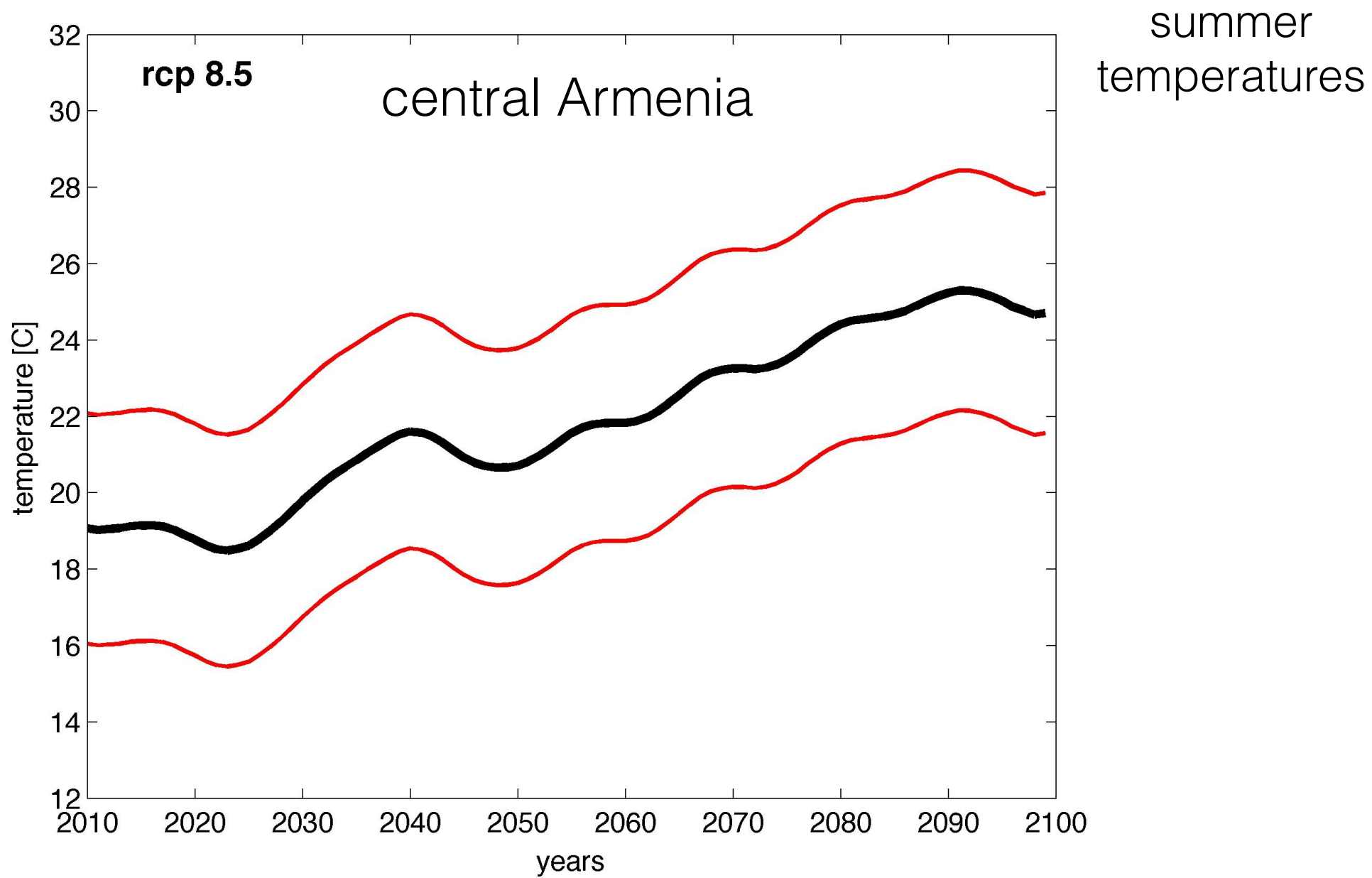


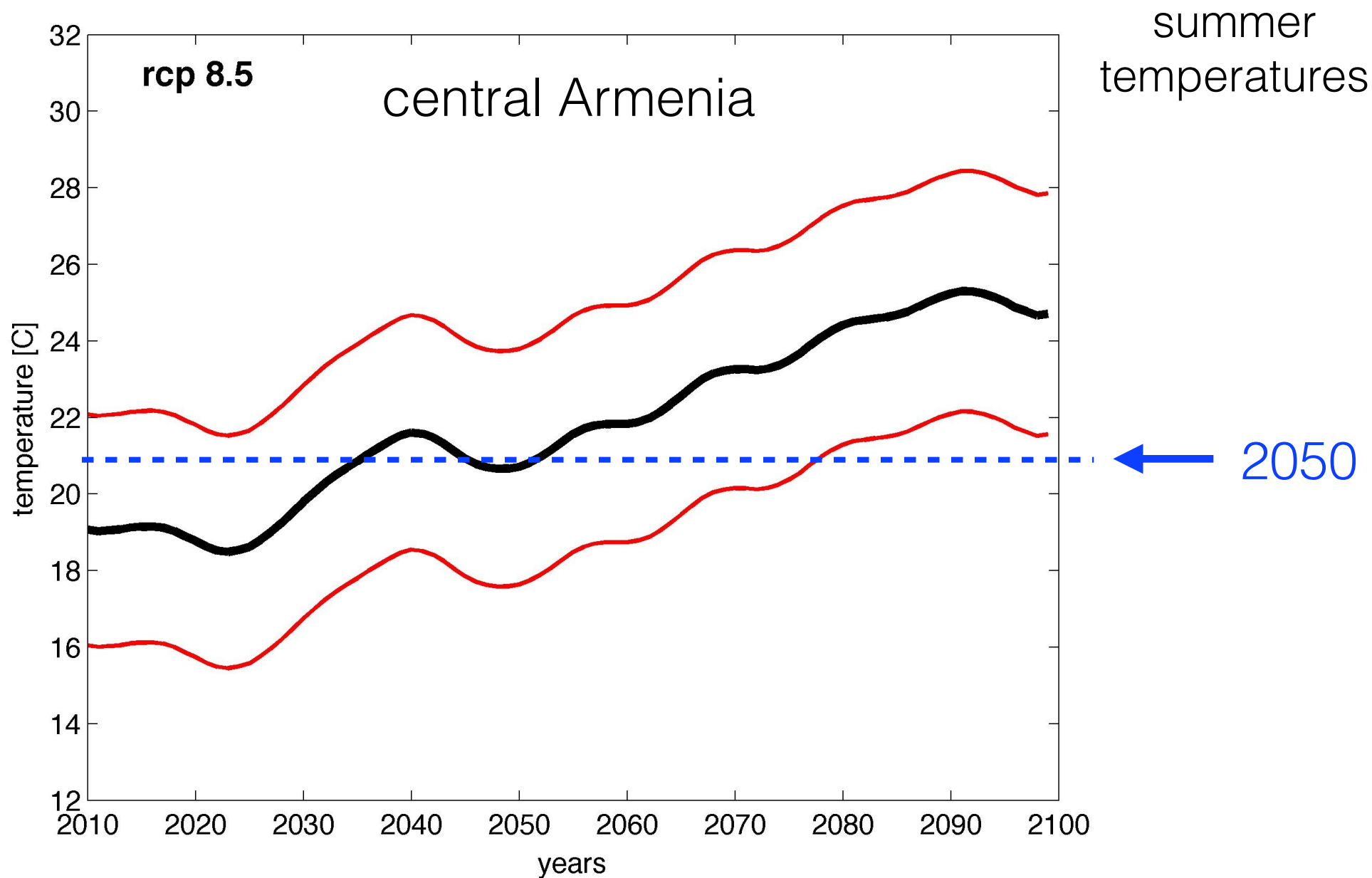
2050 median temperature = warmest year recorded (1960-2010)



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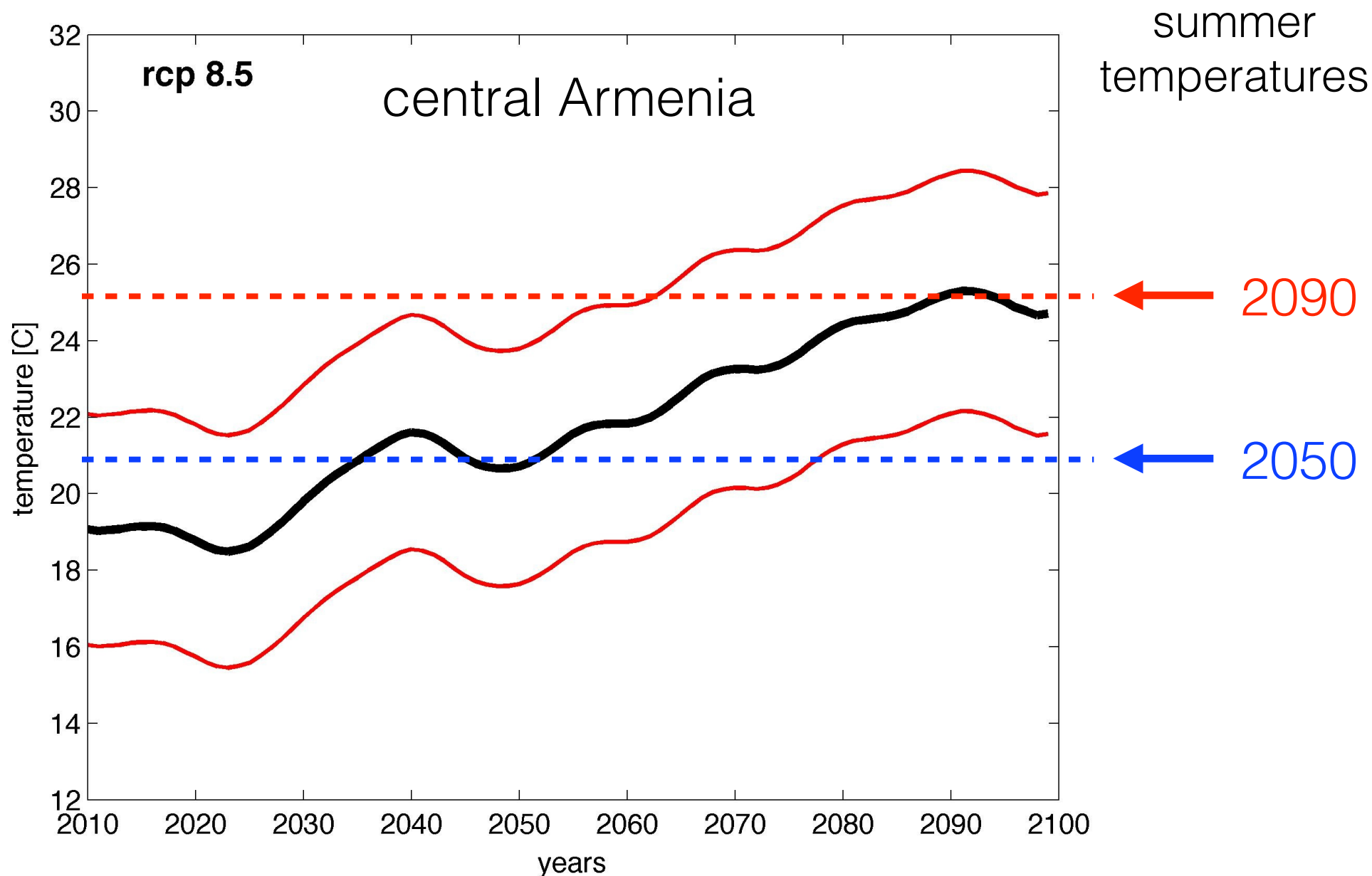
2090 median temperature = most summer will be warmer than  
warmest recorded summer





2050 median temperature = warmest year recorded (1960-2010)





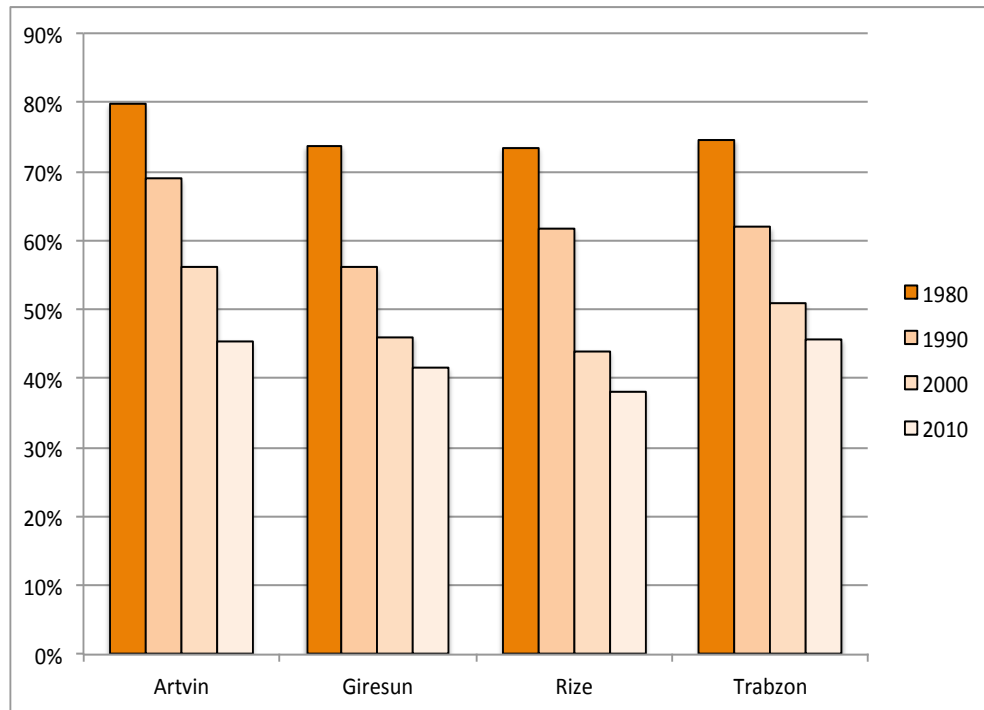
2050 median temperature = warmest year recorded (1960-2010)

2090 median temperature = three out of four summer will be much warmer than warmest observed

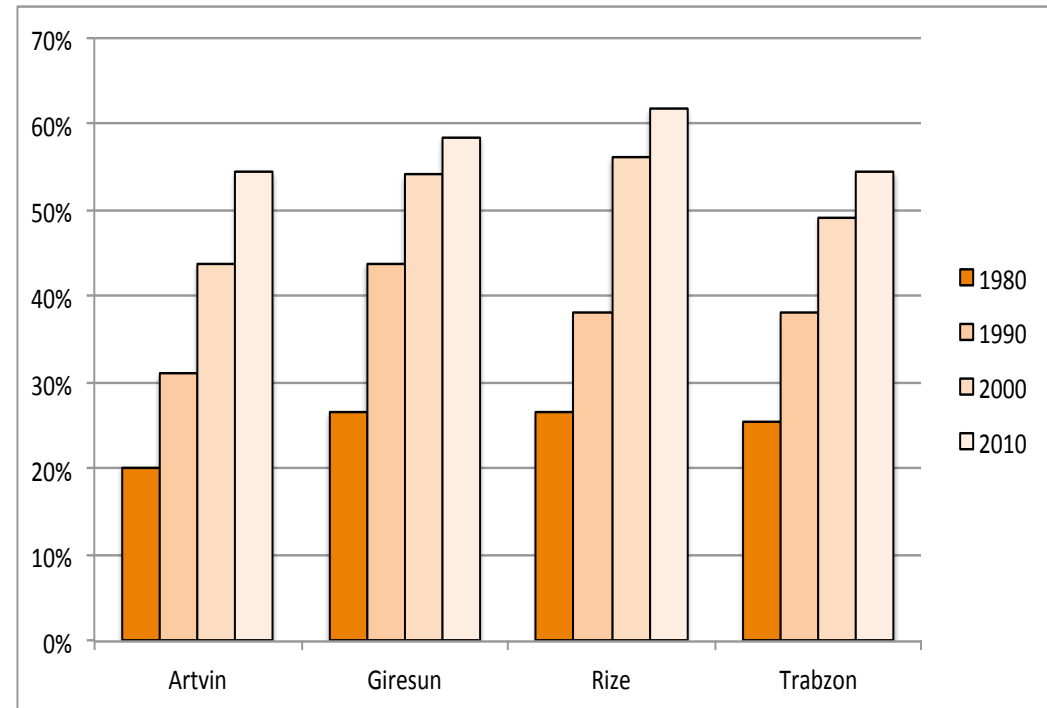
# People

examples from Turkey

# Changes in rural and urban populations



rural population



urban population



changes in mountainous grasslands  
(in this case forest advancing onto grassland)