Analysis of Historical Climate Scenarios of Turkey related to temperature and precipitation for comparing CMIP5 and CMIP6 protocols

Ipeknur HAZAR

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Buket YOGUN

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EGU General Assembly 2022

Outline

1

Display of CMIP5 and CMIP6 model grid points over Turkey

2

Introduction of selected models and Climate Indexes

3

Comparison of the climate index results calculated by the models and the Turkish State Meteorological Service together with the graphics

4

Analyzing the climate index results according to the graphs

MetBee

Istanbul Technical University

Objectives

First Objective

Calculation of climate indices with Climate Data Operator (CDO) for CMIP5 and CMIP6 models

Second Objective

Comparison of the results of the climate index of the Turkish State Meteorological Service, CMIP5 and CMIP6 data

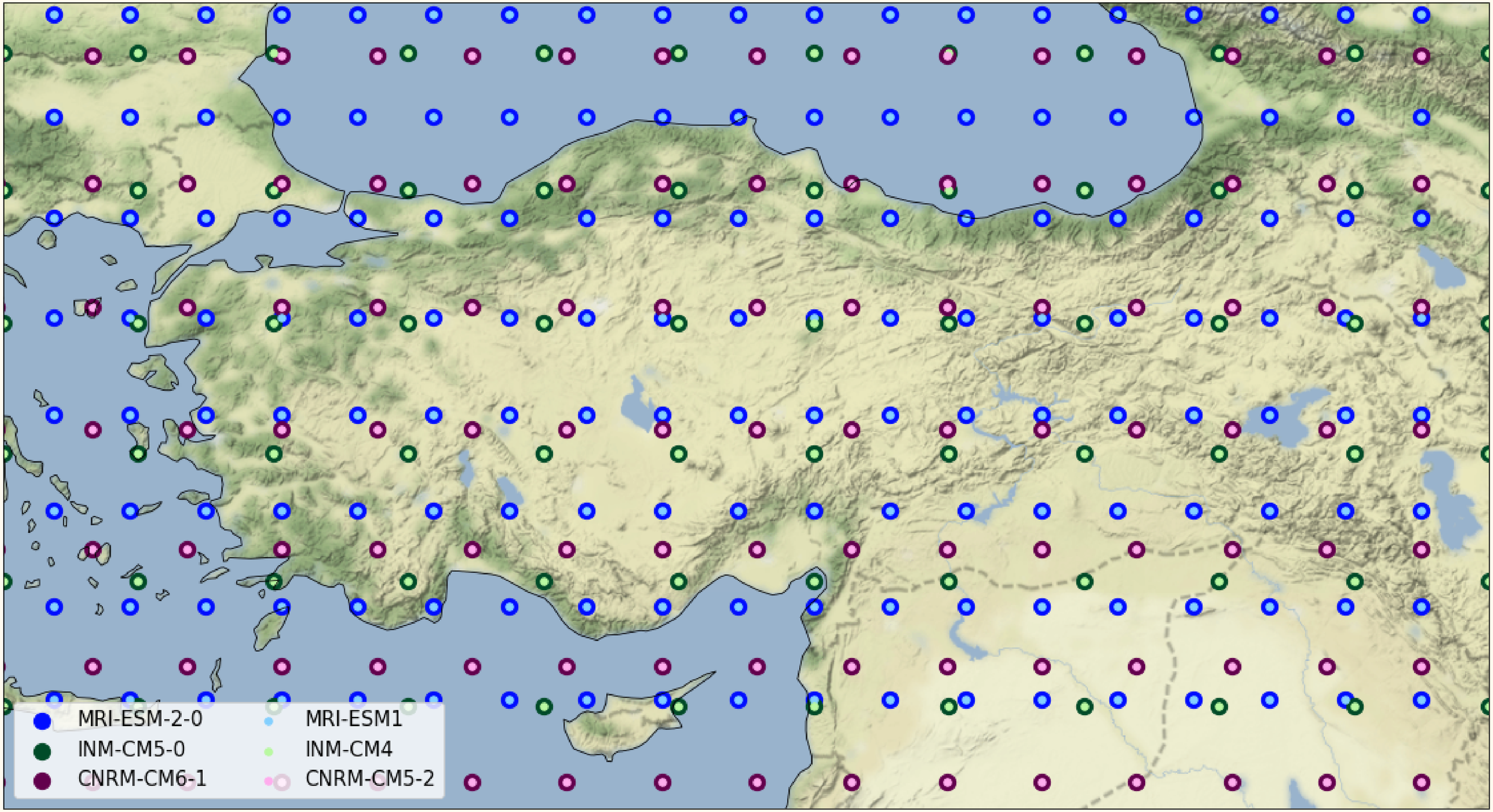
Third Objective

To compare the consistency of all models from CMIP5 and CMIP6 on Turkey

MetBee
Istanbul Technical University

CMIP5 AND CMIP6 MODEL GRID POINTS IN TURKEY

ITU MetBee



Models and Climate Indices with Climate Data Operators (CDO) Used in the Study

CMIP5 Models and Resolutions	CMIP6 Models and Resolution
CNRM-CM5-2 256 lon - 128 lat	CNRM-CM6-1 256 lon - 128 lat
MRI-ESM1 320 lon - 160 lat	MRI-ESM2-0 320 lon - 160 lat
INM-CM4 180 lon - 120 lat	INM-CM5-0 180 lon - 120 lat

Climate Indices with CDO	
Temperature	Precipitation
ECAETR	ECAPD
ECATN90P	ECASDII
ECATX90P	

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Reference Period

1976-2005

ECAETR

Intra-period extreme temperature range

Index Calculation

To get the intra-period extreme temperature range for two time series of maximum and minimum temperatures

ECATN90P

Warm nights percent window reference time (w.r.t.) 90th percentile of reference period

Index Calculation

To compute the percentage of timesteps with a daily minimum temperature greater than the 90th percentile of the daily minimum temperatures for a given reference period use

ECATX90P

Very warm days percent window reference time (w.r.t.) 90th percentile of reference period

Index Calculation

To compute the percentage of timesteps with a daily maximum temperature greater than the 90th percentile of the daily maximum temperatures for a given reference period

ECAPD

Precipitation days index per time period

Index Calculation

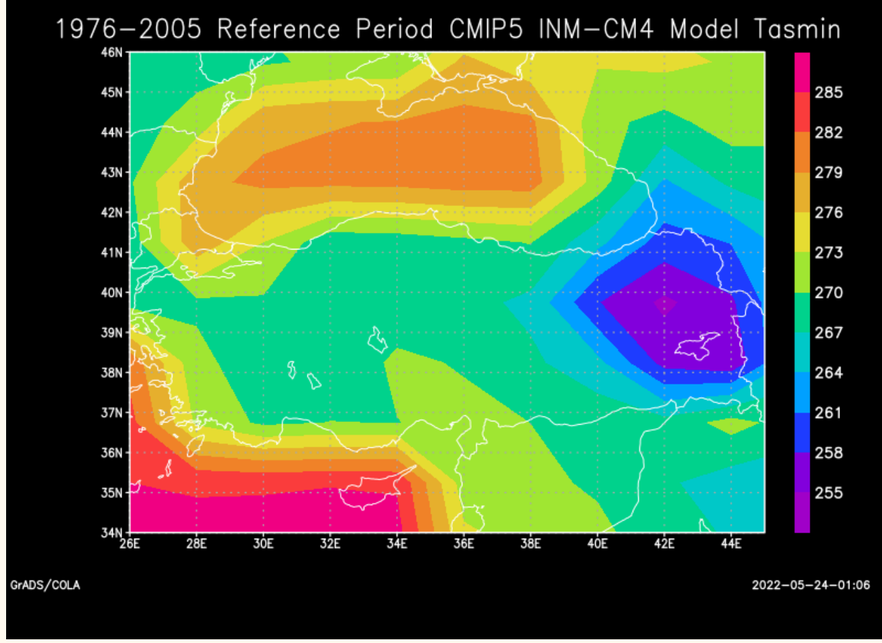
To get the number of days with precipitation greater than 25 mm for a time series of daily precipitation amounts

ECASDII

Simple daily intensity index per time period

Index Calculation

To get the daily intensity index of a time series of daily precipitation amounts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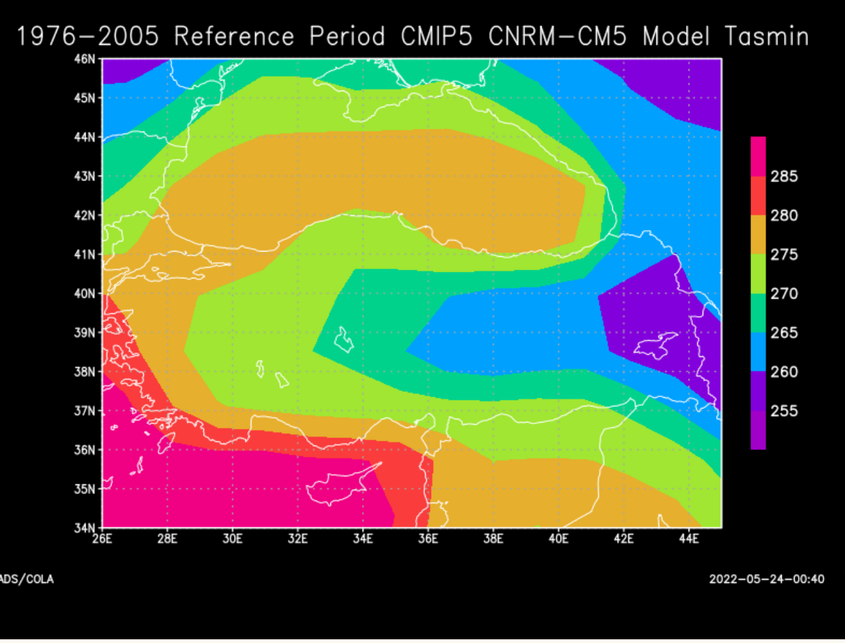
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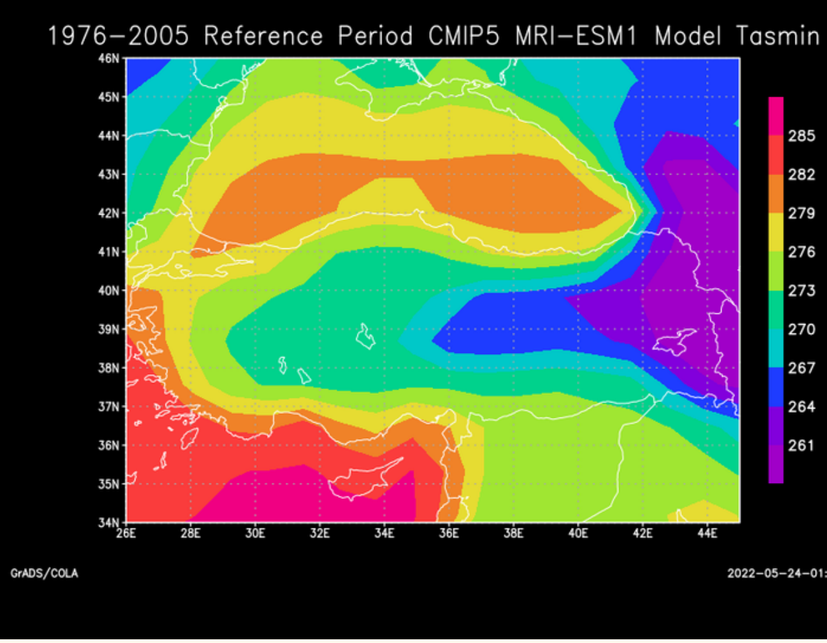
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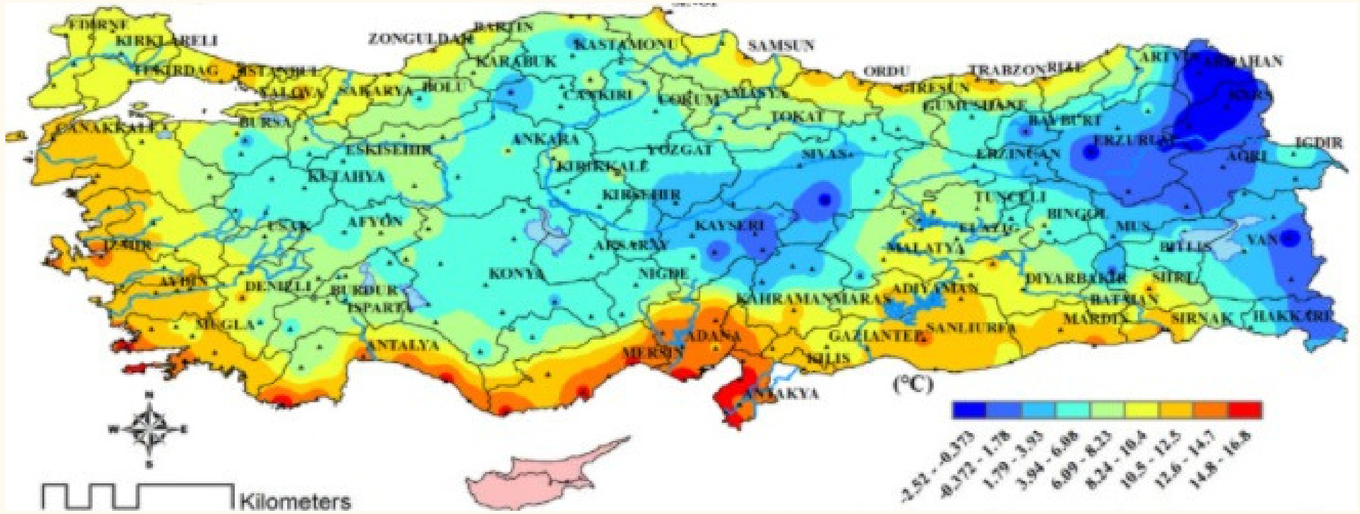
GrADS/COLA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MARDIN
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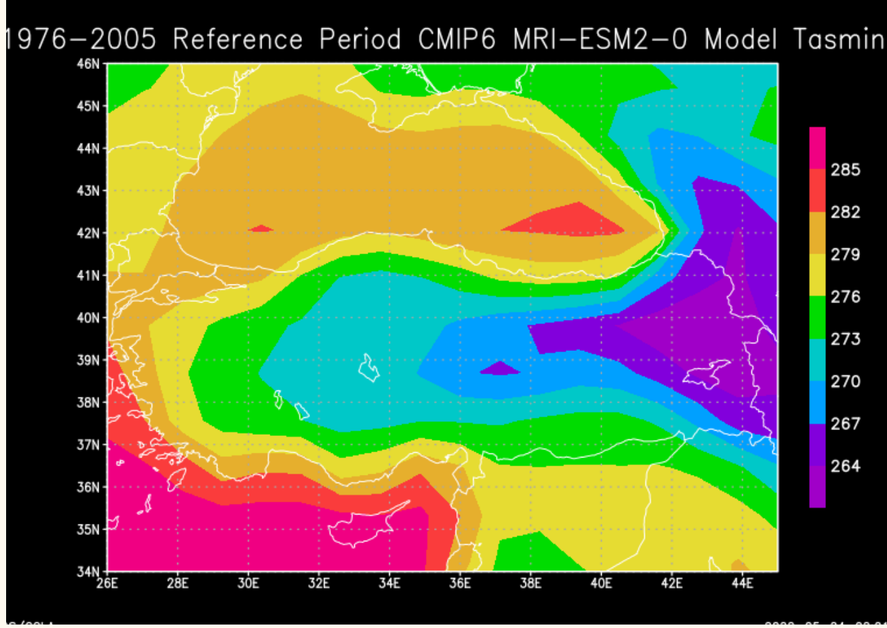
MUGLA
ANTALYA
ADANA
GAZIANTEP
SANLIURFA
MERSIN
HATAY
OSMANIYE
(°C)
-2.52 - -0.373
-0.372 - 1.78
1.79 - 3.93
3.94 - 6.08
6.09 - 8.23
8.24 - 10.4
10.5 - 12.5
12.6 - 14.7
14.8 - 16.8
Kilometers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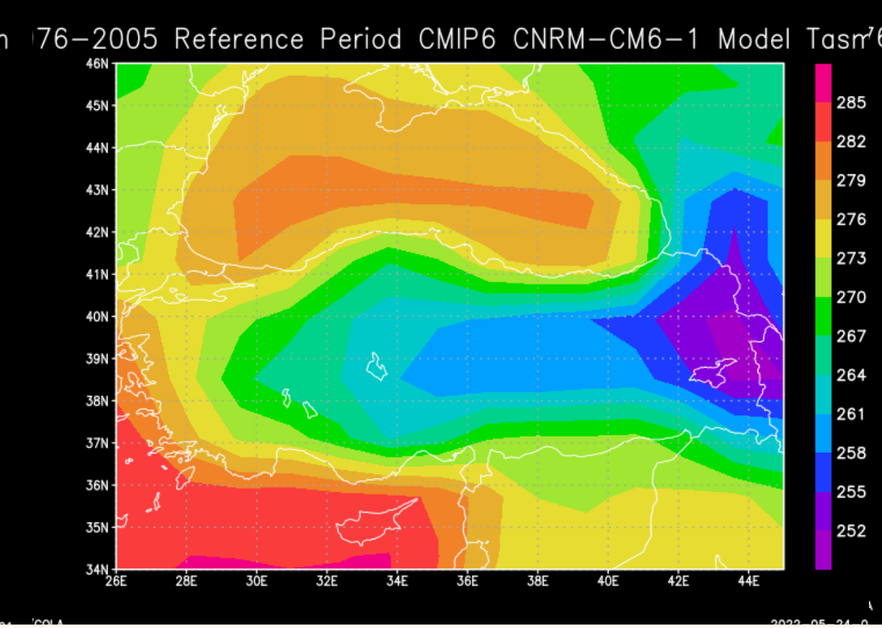
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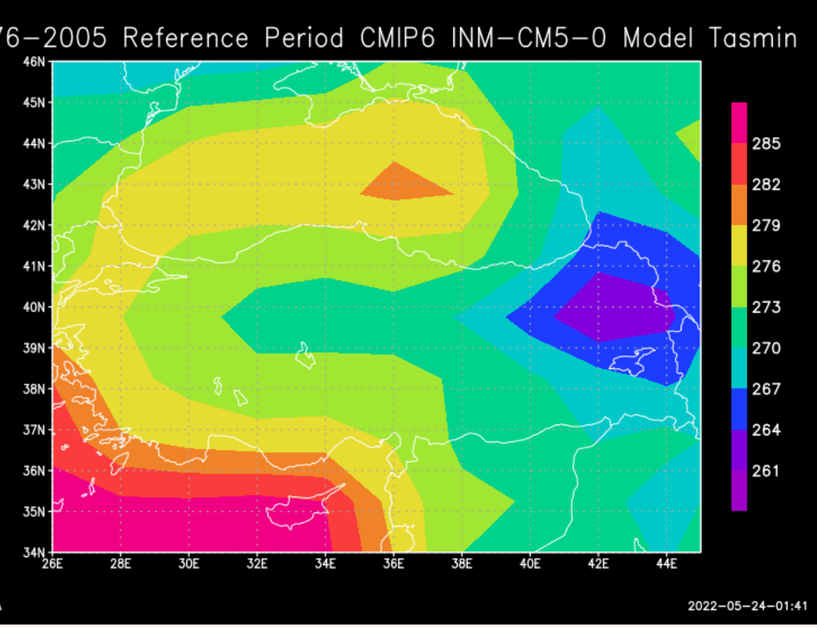
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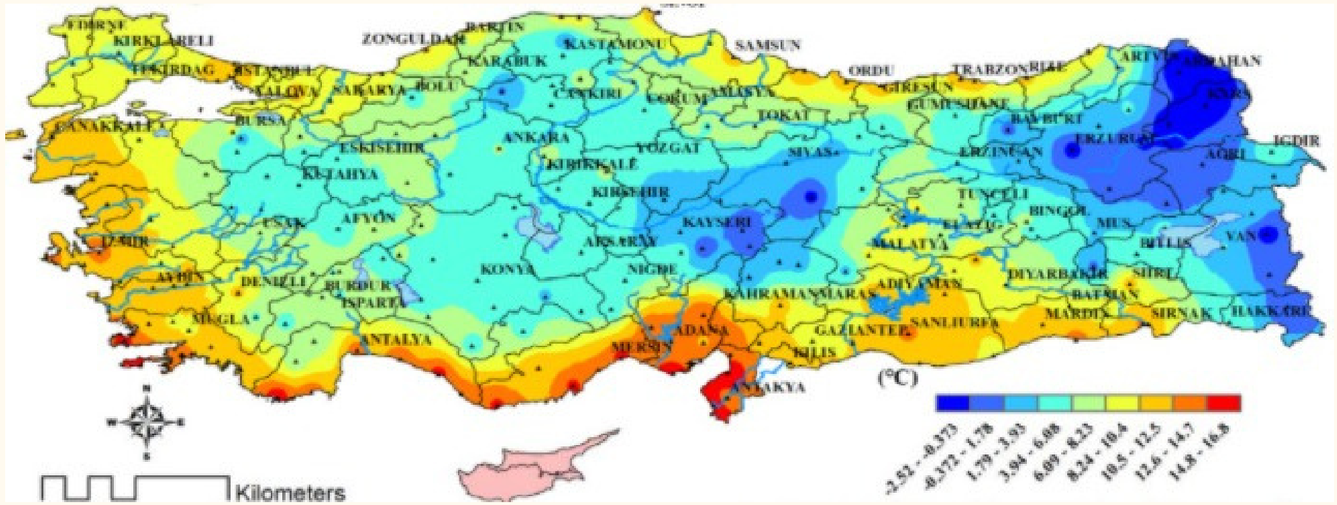
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(°C)
-2.52 - -0.373
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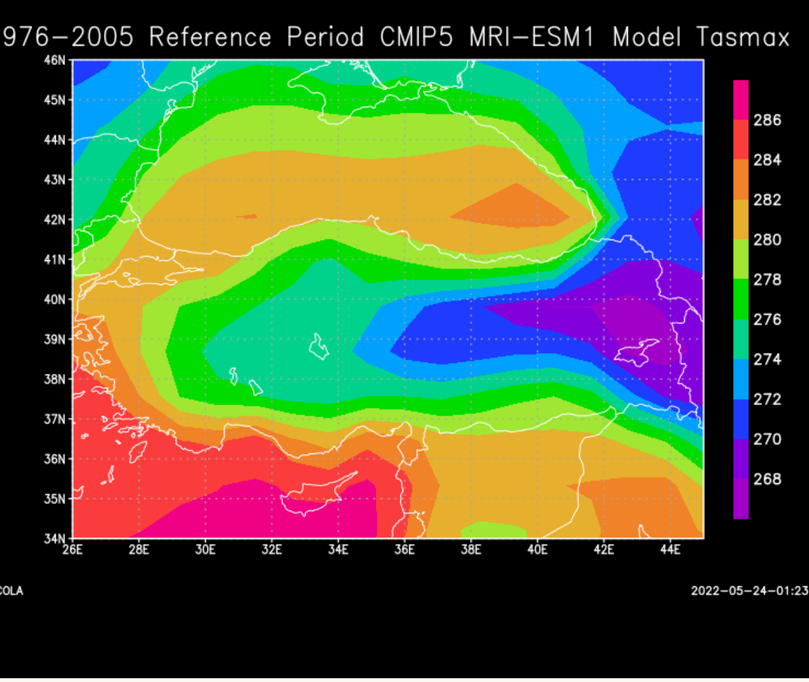
10.5 - 12.5
12.6 - 14.7
14.8 - 16.8
Kilometers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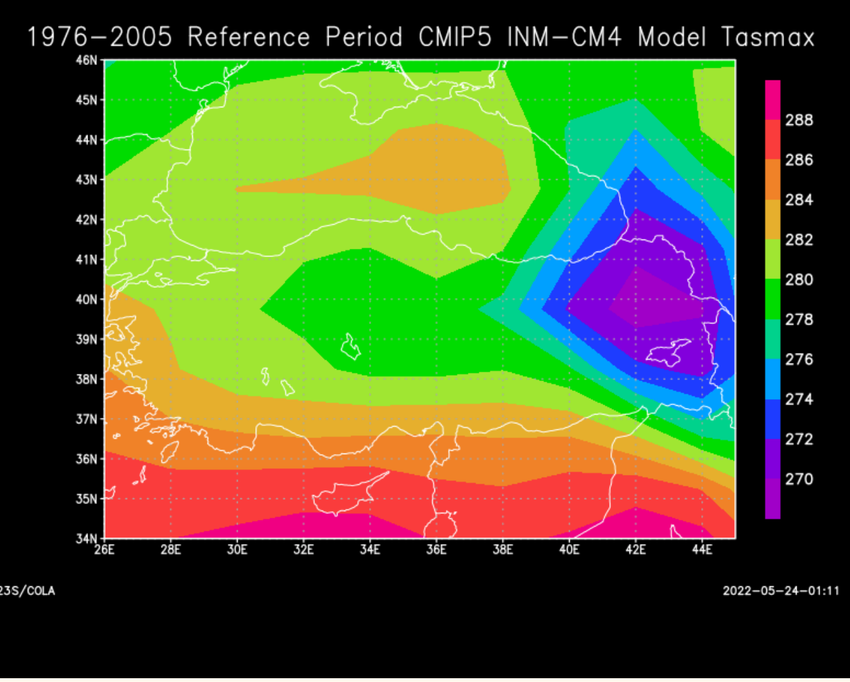
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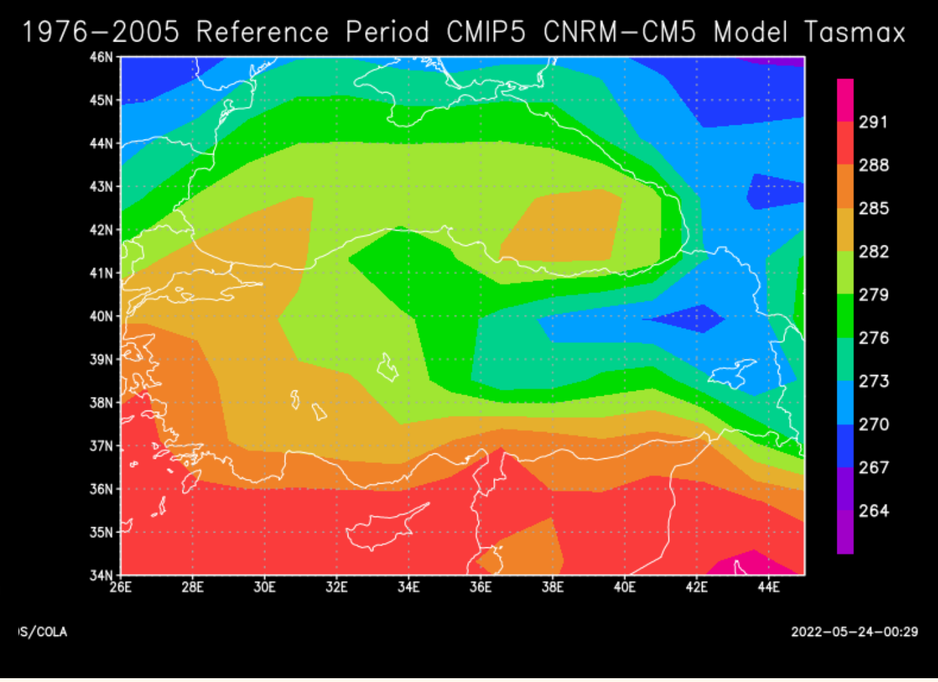
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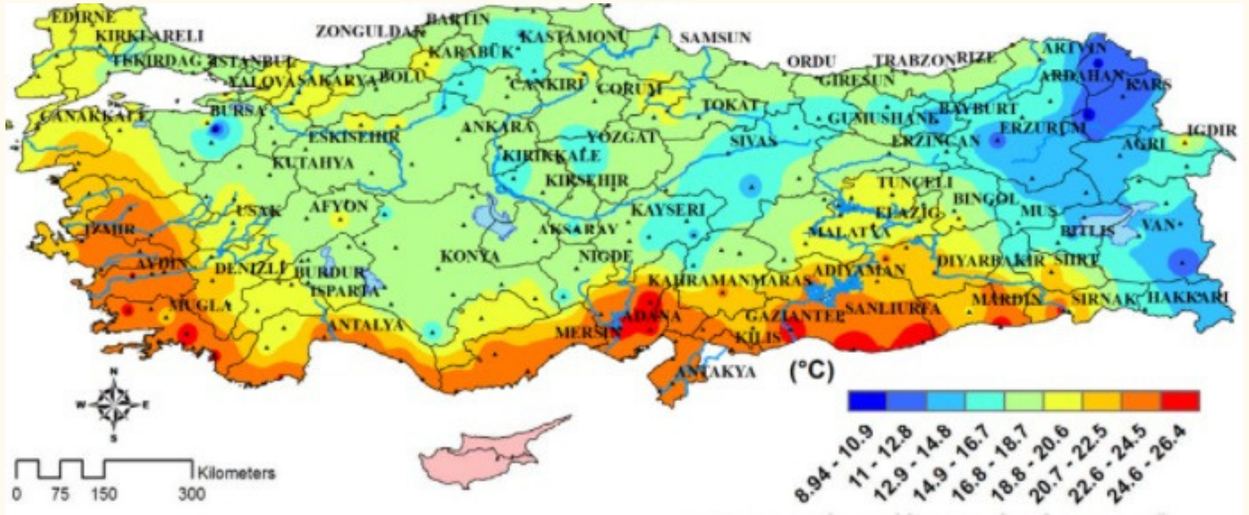
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Kilometers
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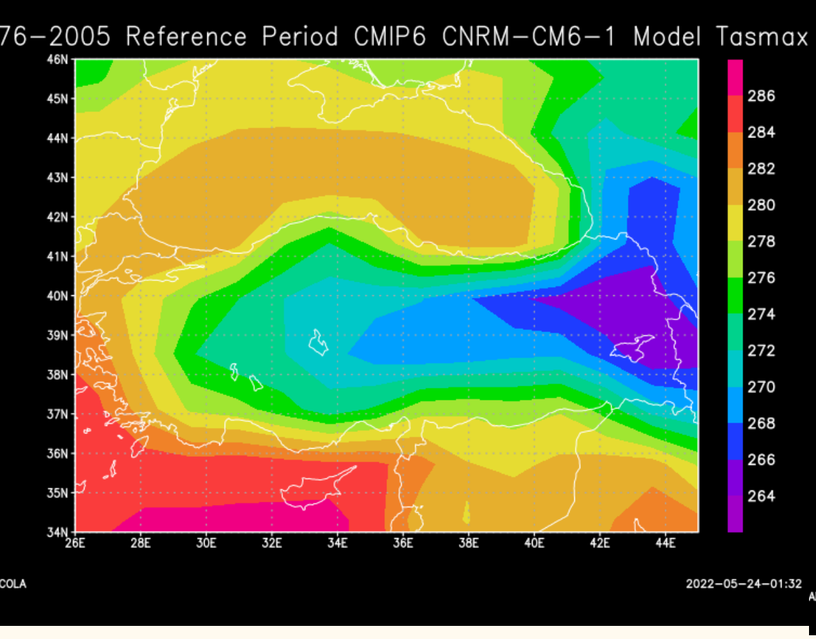
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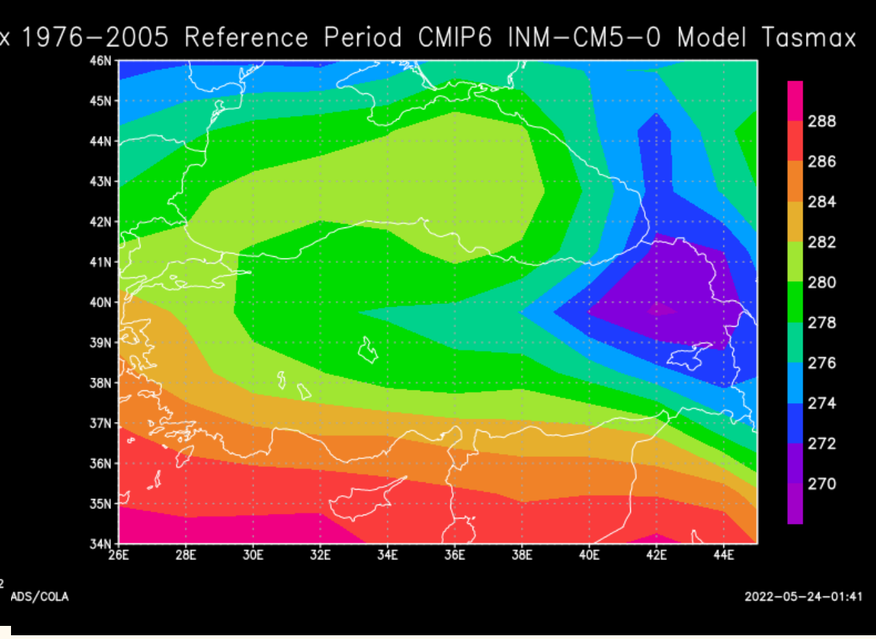
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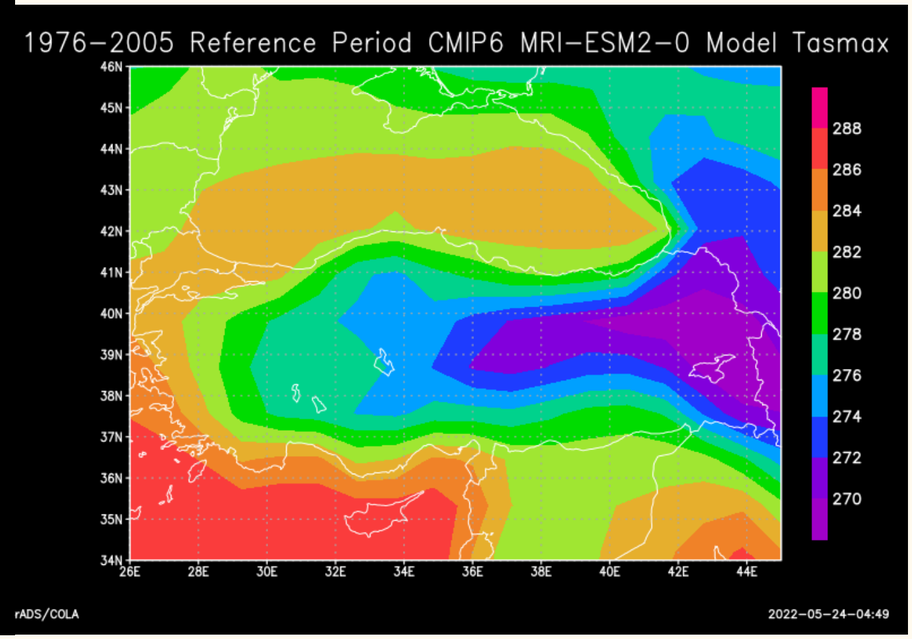
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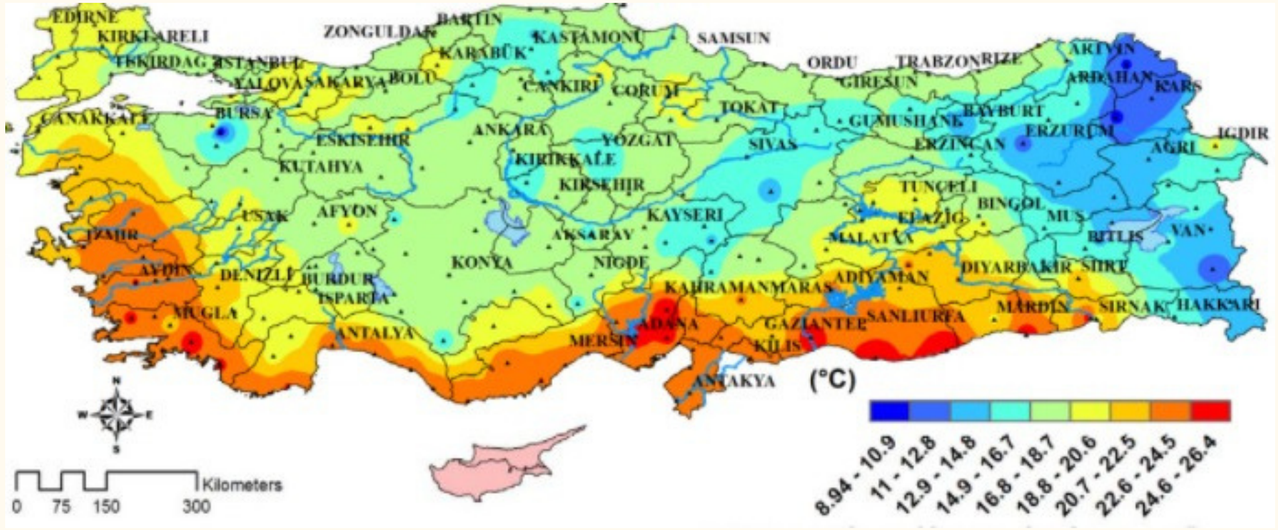
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24.6 - 26.4
Kilometers
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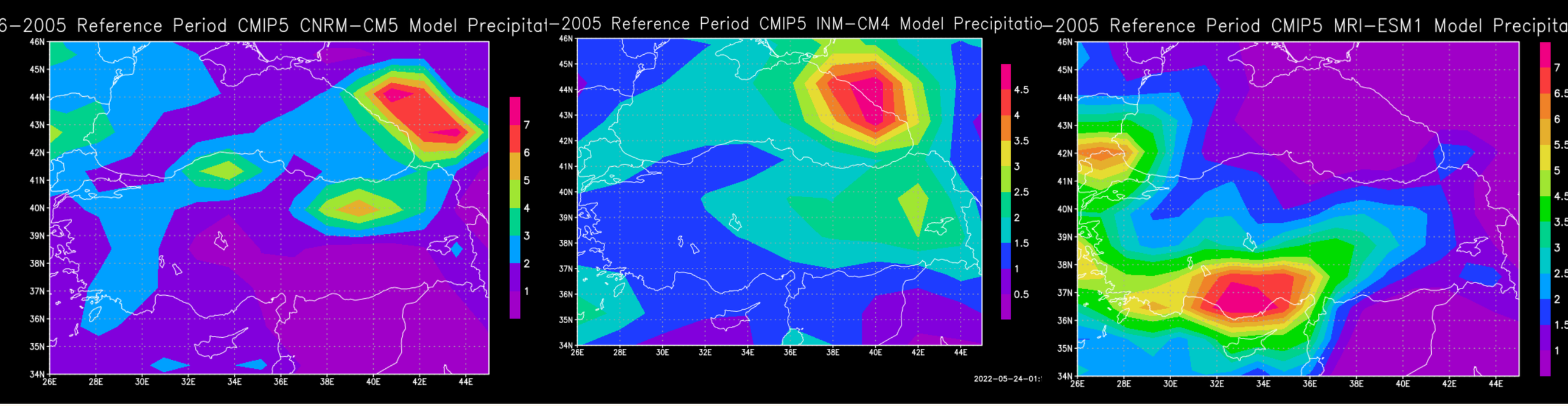
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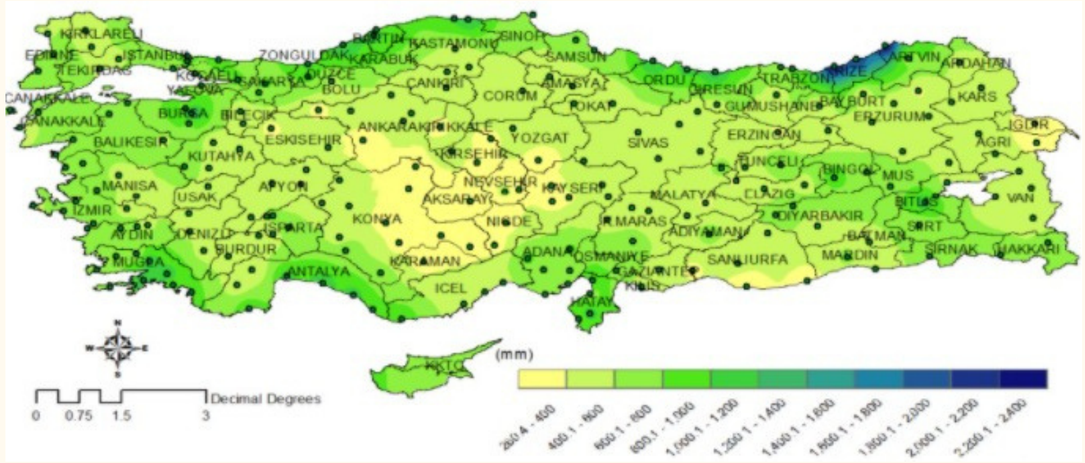
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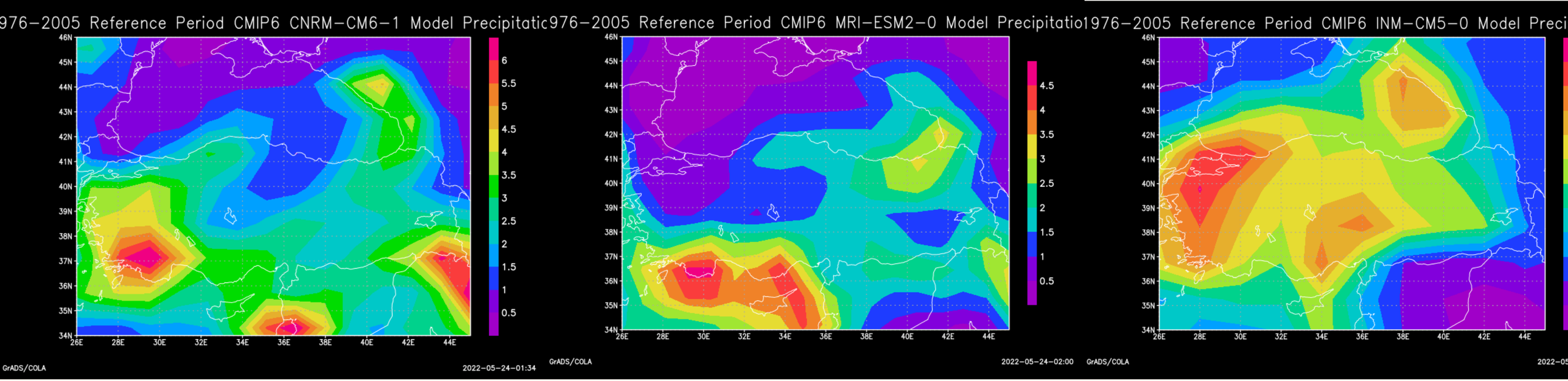
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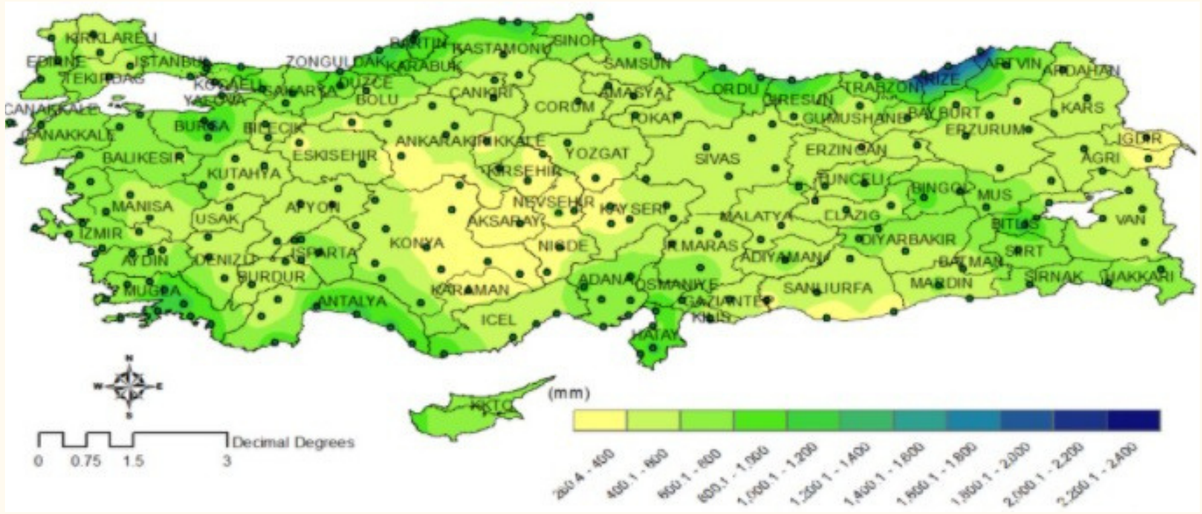
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KARAMAN
GAZIANTEP
ANTALYA
ICEL
KILIS
HATAY
KKTC
(mm)
260.4 - 400
400.1 - 600
600.1 - 800
800.1 - 1,000
1,000.1 - 1,200
1,200.1 - 1,400
1,400.1 - 1,600
1,600.1 - 1,800
1,800.1 - 2,000
2,000.1 - 2,200
2,200.1 - 2,400
Decimal Degrees
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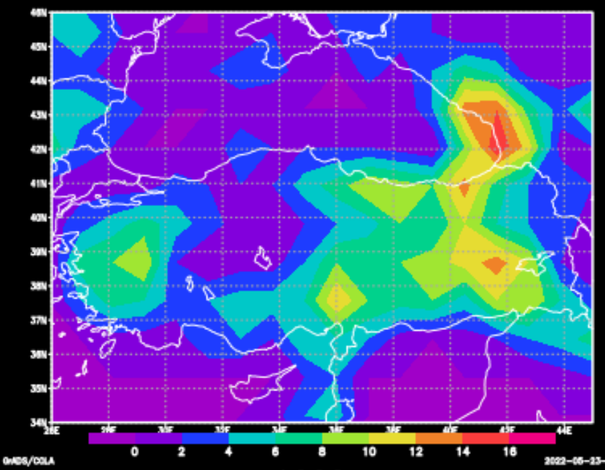
0.75
1.5
3

CMIP 5-CMIP6

CMIP5 MRI-ESM1 ECAETR

1982



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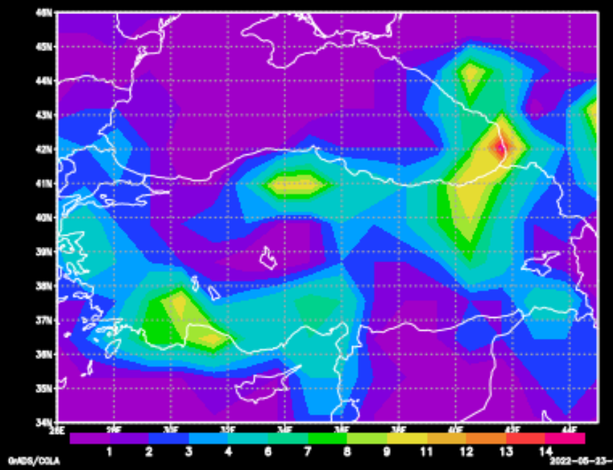
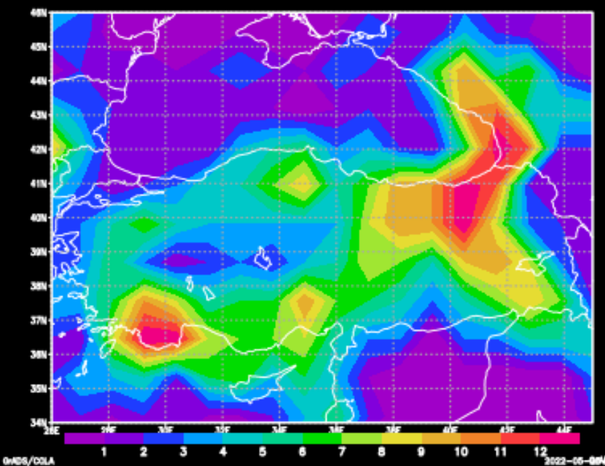
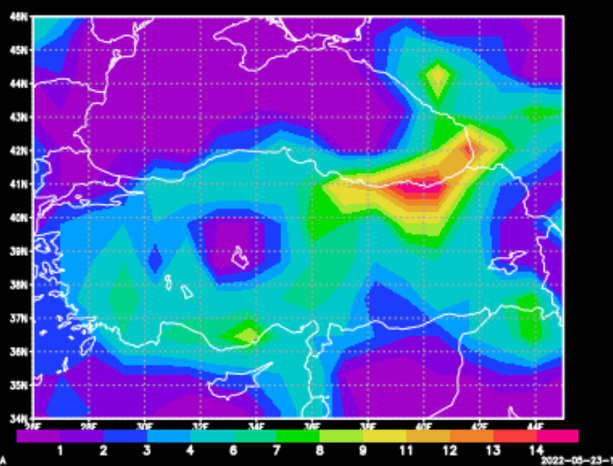


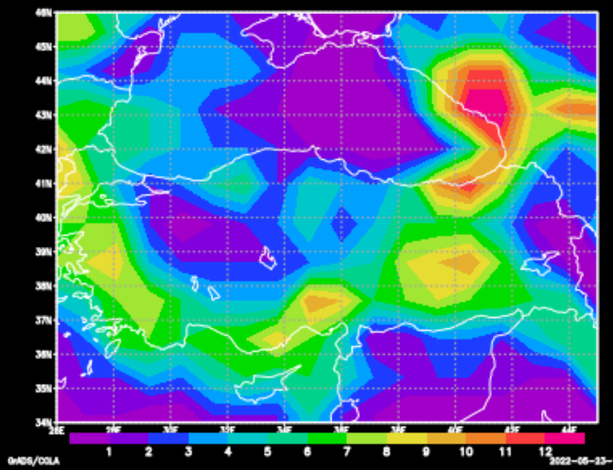
1988





CMIP6 MRI-ESM2-0 ECAETR

1982



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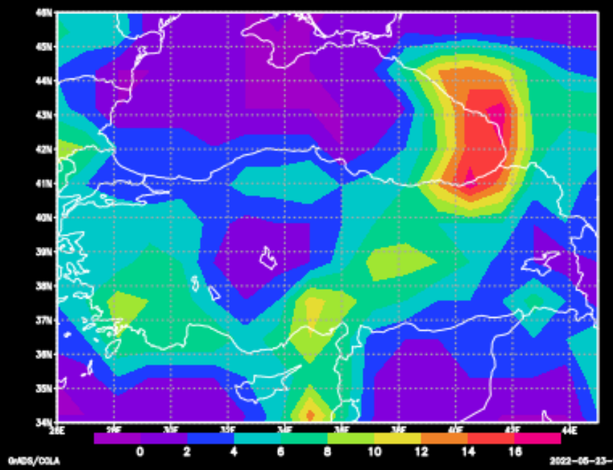

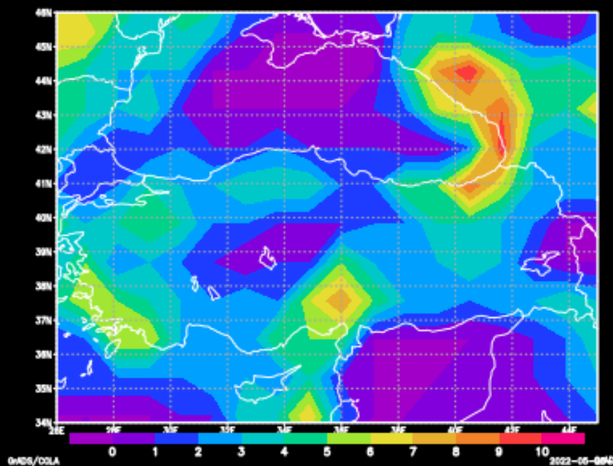

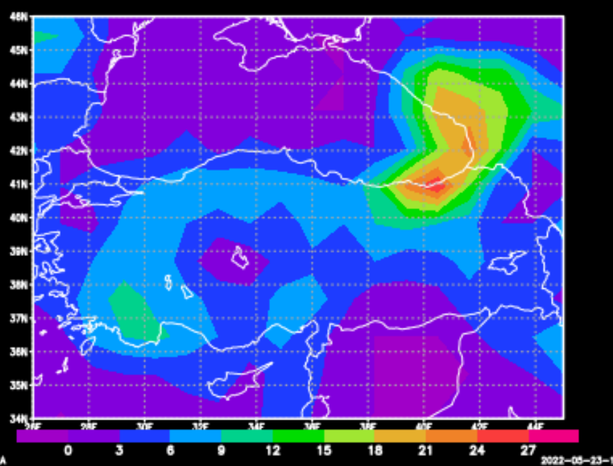

CMIP 5-CMIP6

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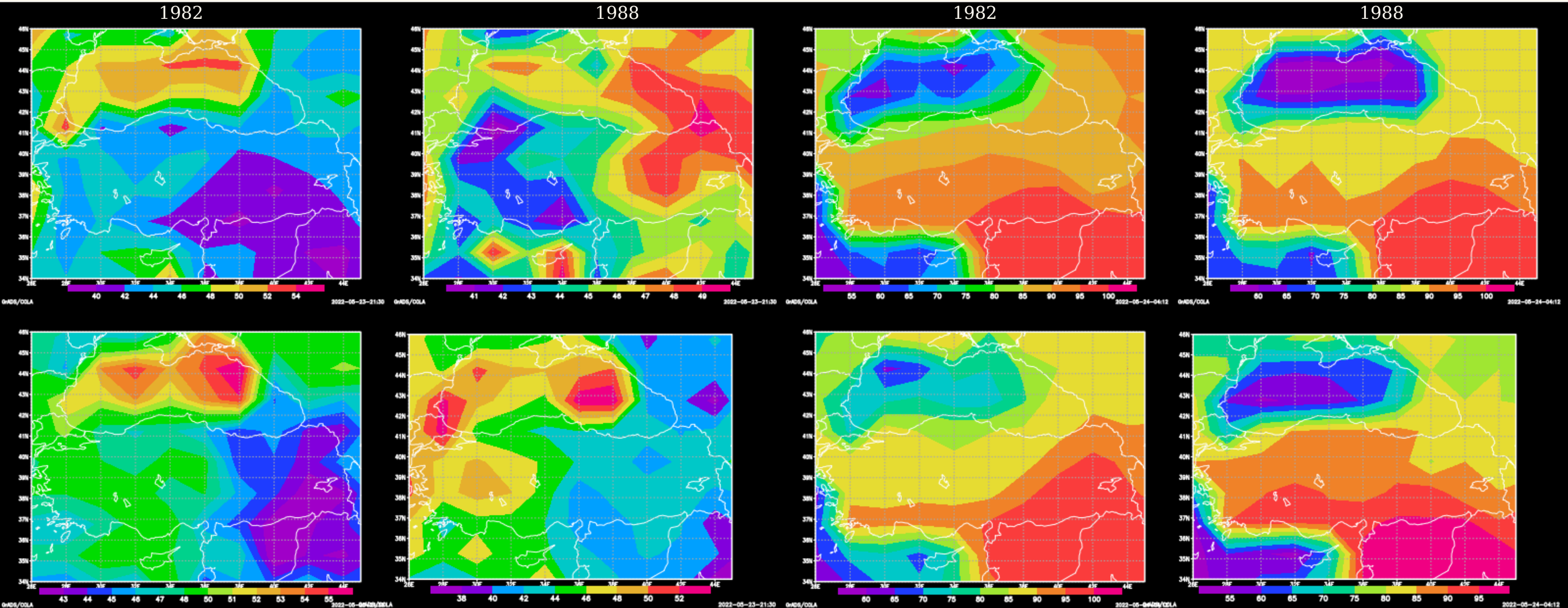

CMIP 5-CMIP6

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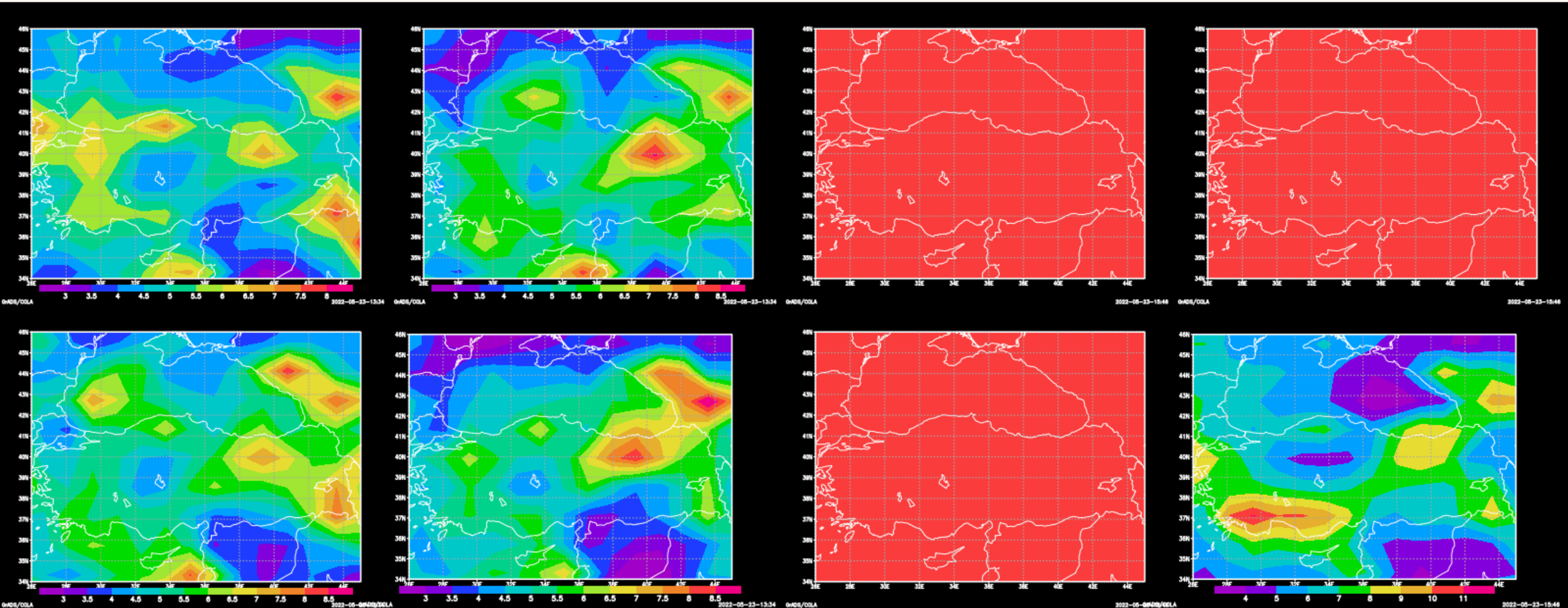

Thank You For Listening

Questions and Comments

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