

T. C.

Orman ve Su İşleri Bakanlığı
Meteoroloji Genel Müdürlüğü



Climate Change Projections For TURKEY

Alper AKÇAKAYA

Meteoroloji Genel Müdürlüğü
Araştırma Daire Başkanlığı
Klimatoloji Şube Müdürlüğü
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Presentation's Content

1- Observed Changes in the World and Turkey

2- Regional Model Results

- Models and data Sets**
- Temperature and Precipitation Projections**

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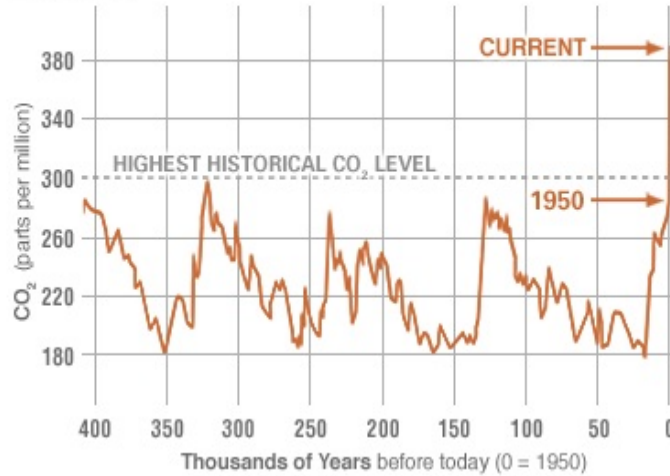
Observed Changes in the World and Turkey



Concentration of Carbon Dioxide

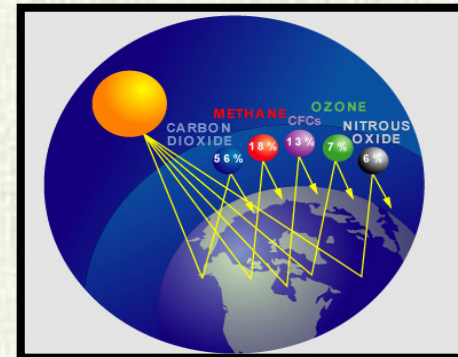
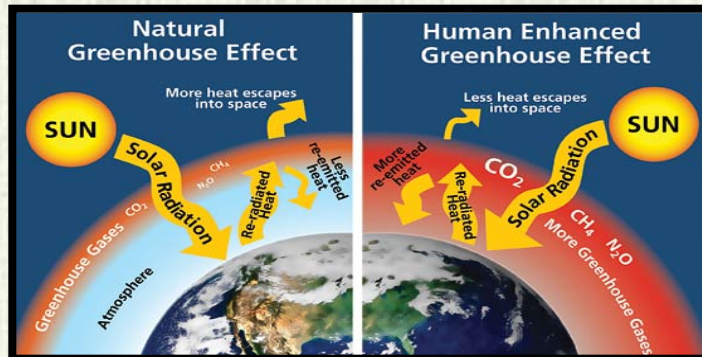
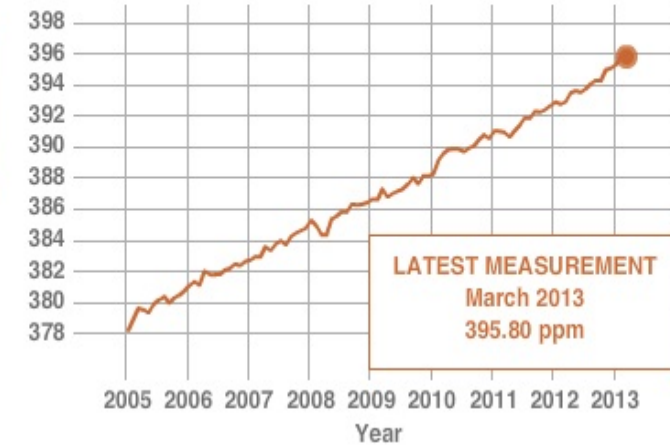
PROXY (INDIRECT) MEASUREMENTS

Data source: Reconstruction from ice cores.
Credit: NOAA



DIRECT MEASUREMENTS: 2005-PRESENT

Data source: Monthly measurements (corrected for average seasonal cycle). Credit: NOAA

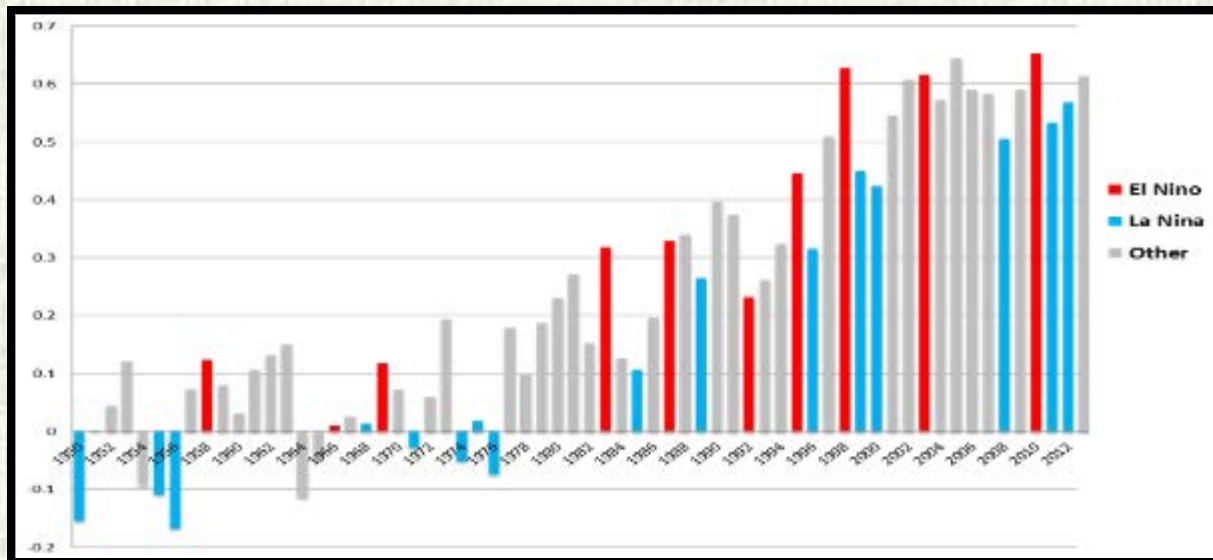
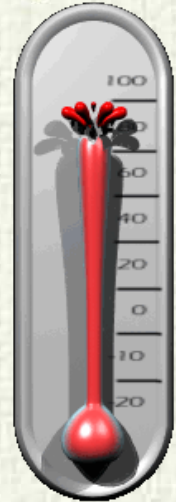
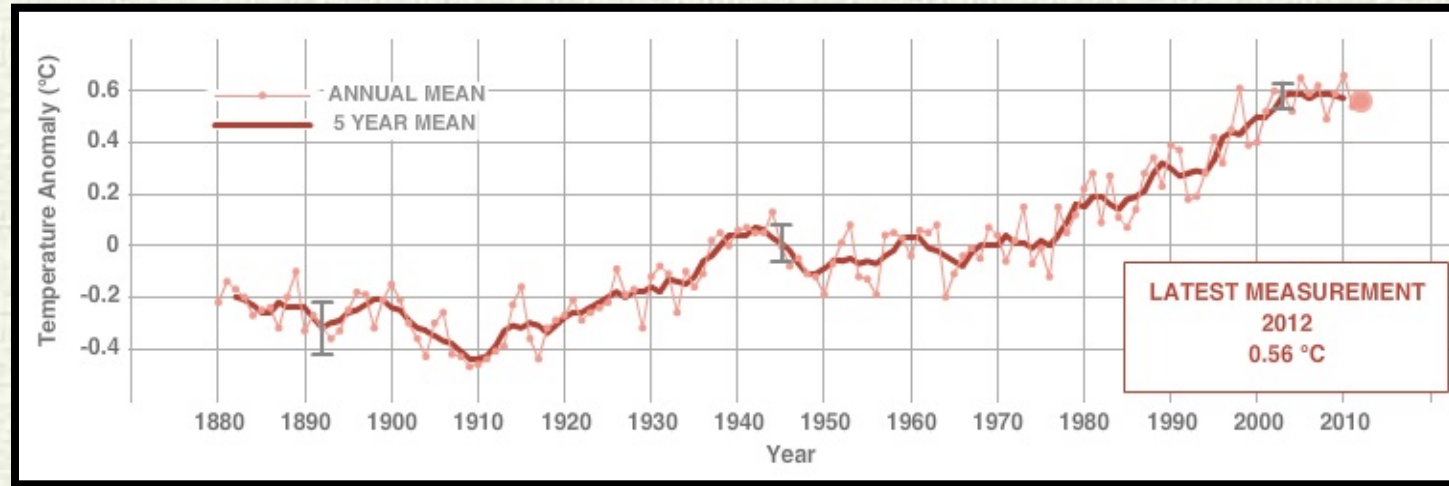


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Global Temperature Rise





Decadal global combined surface-air temperature over land & sea (°C) from the average over the three independent datasets

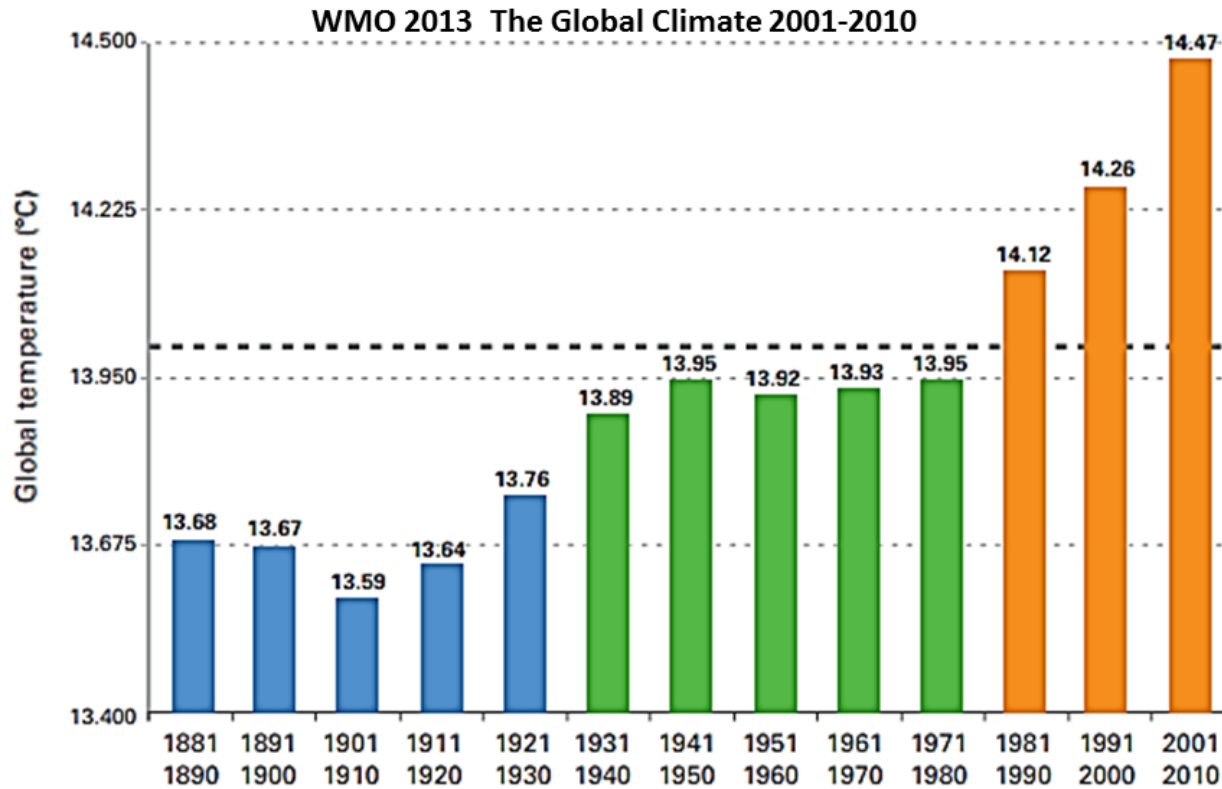
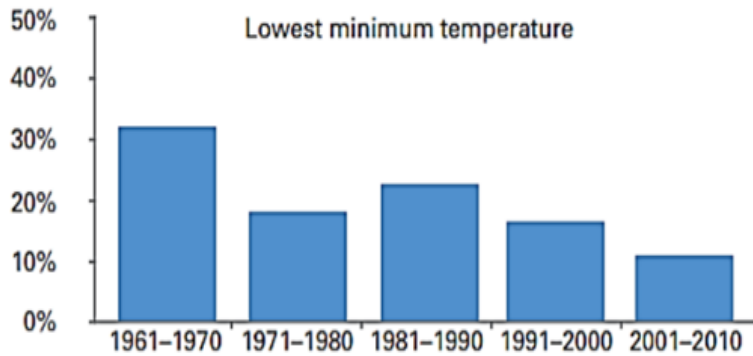
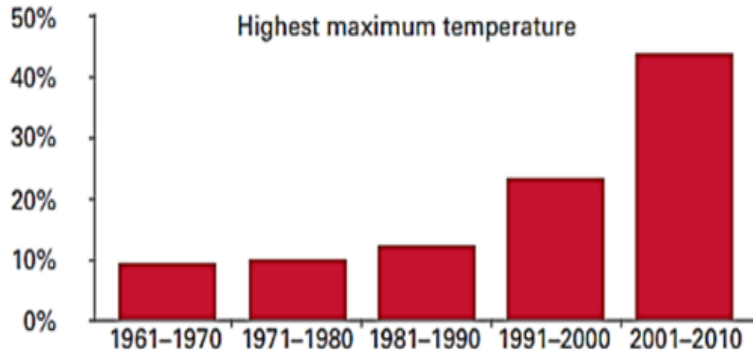


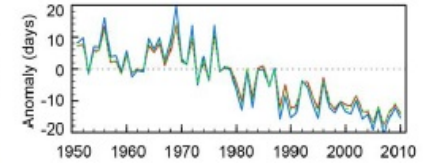
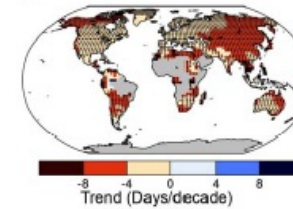


Figure 4. Absolute country records of the daily maximum and minimum temperature in the last five decades

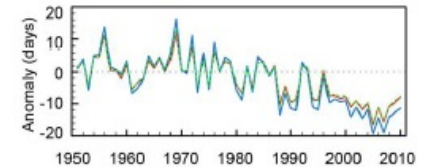
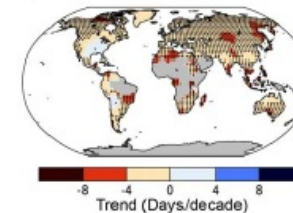


WMO 2013 The Global Climate 2001-2010

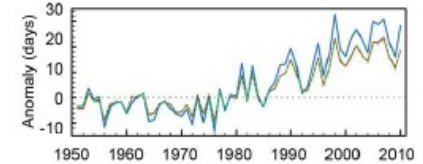
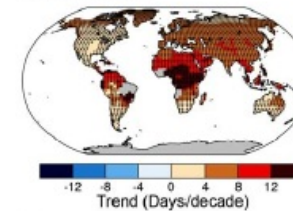
(a) Cold Nights



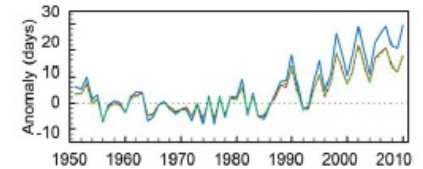
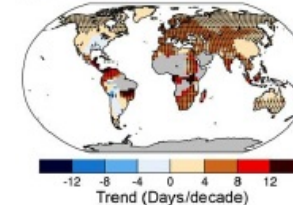
(b) Cold Days



(c) Warm Nights



(d) Warm Days



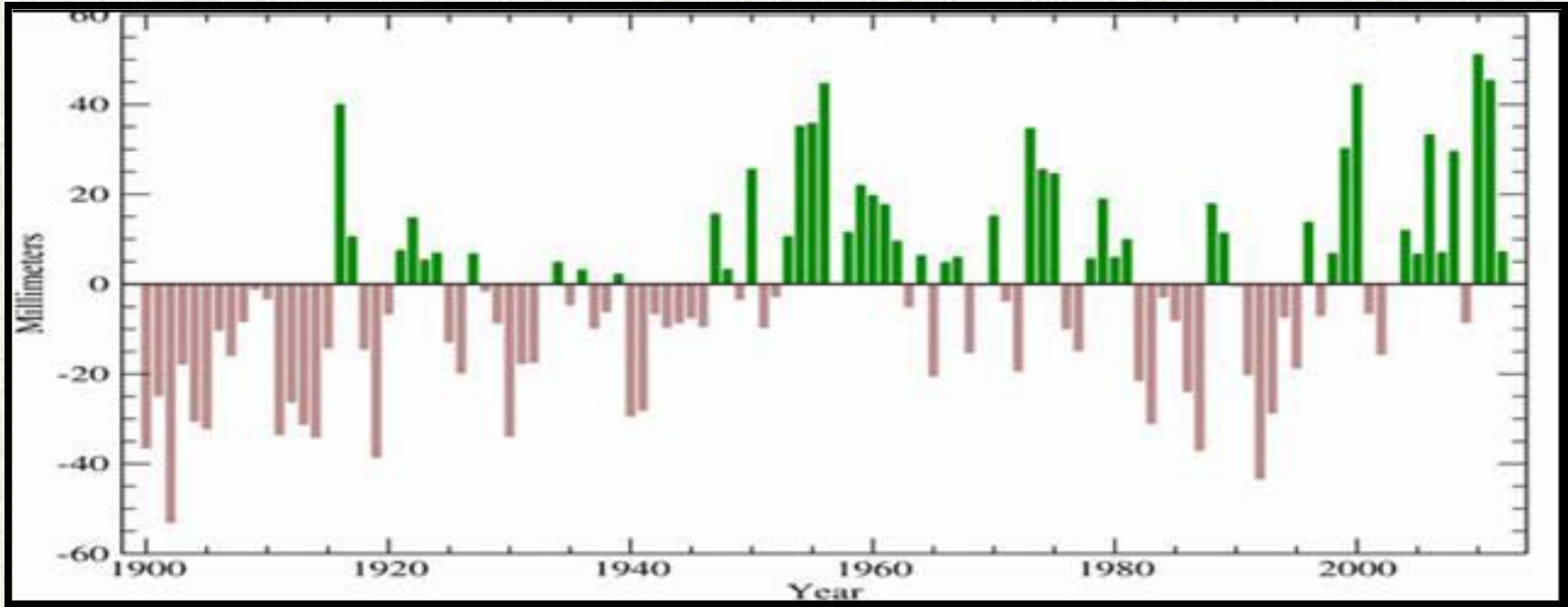
— HadEX2
— HadGHCND
--- GHCNDEX

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Meteoroloji Genel Müdürlüğü



Global Precipitation Anomaly



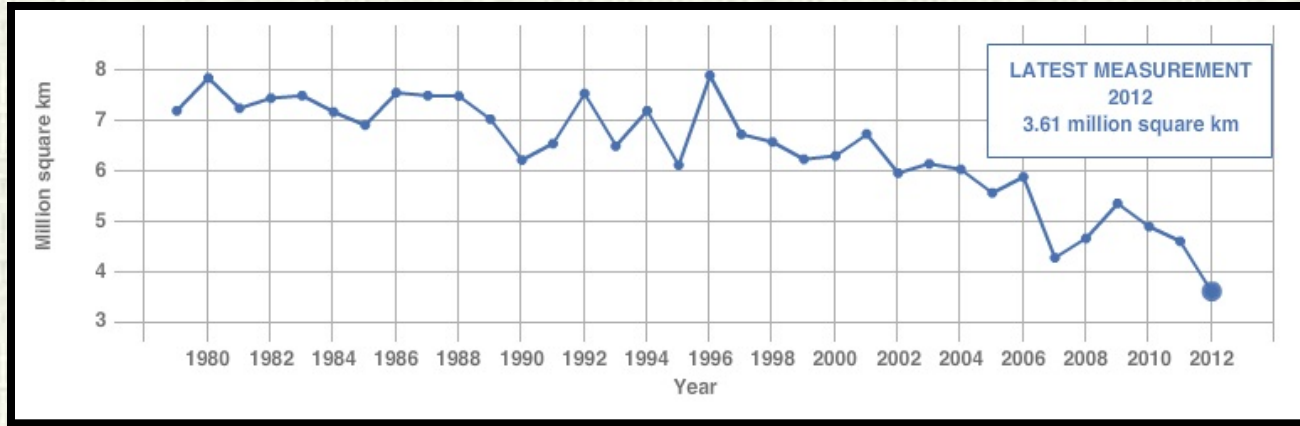
2010 = 50 mm

2011 = 45 mm

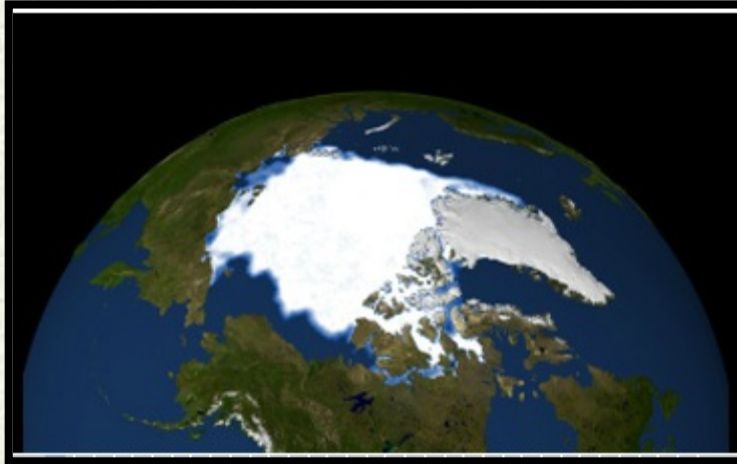
2012 = 6.3 mm



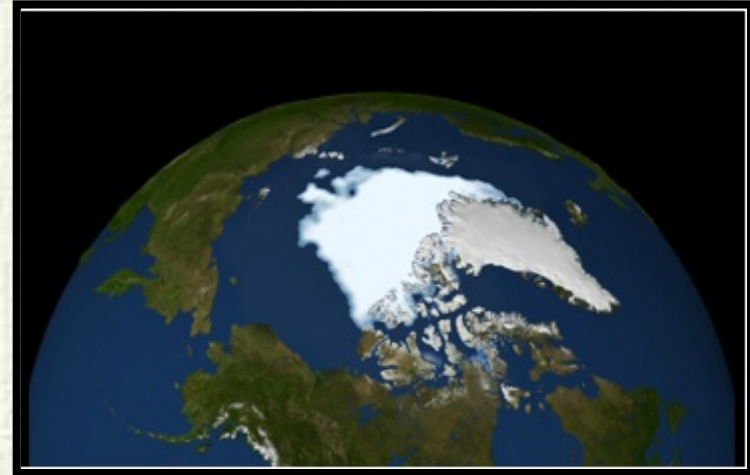
Arctic Glaciers



1979



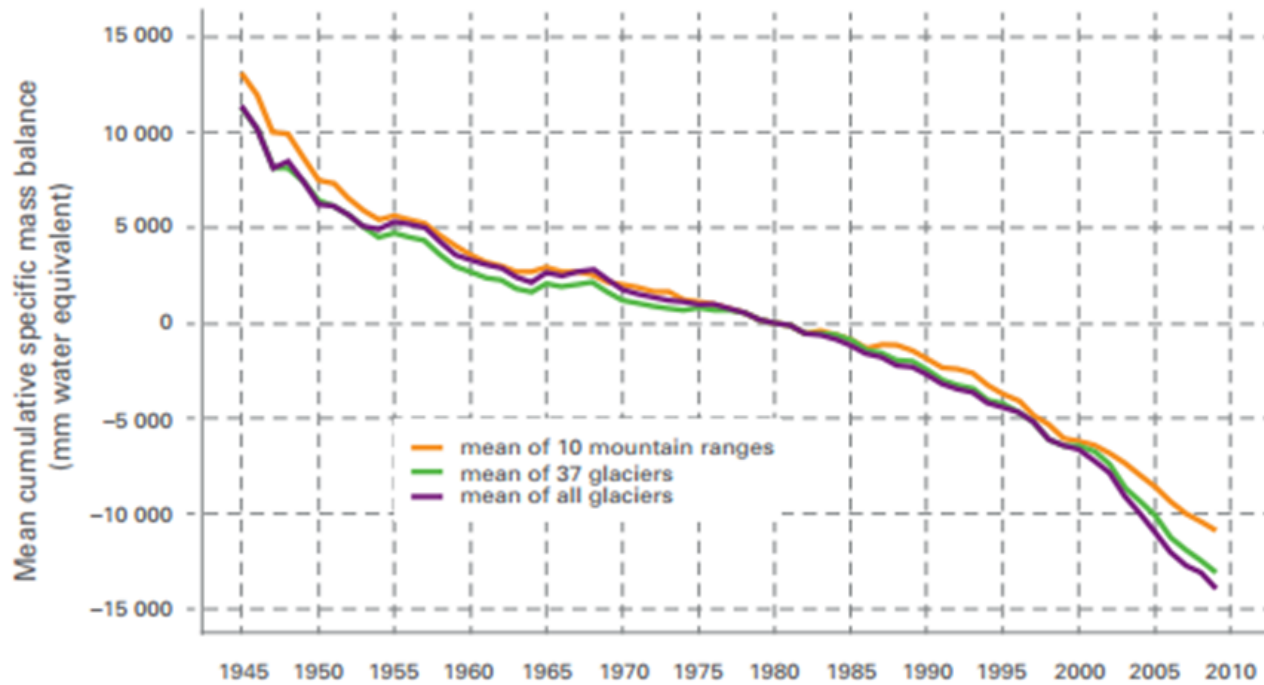
2012





Melting world glaciers

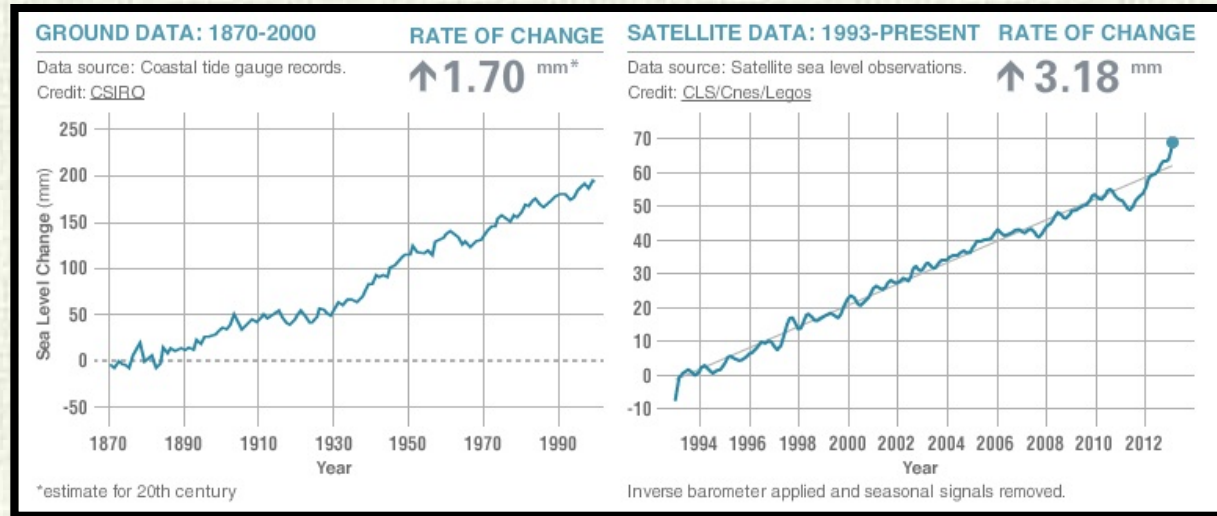
Figure 10. Mean cumulative specific glacier mass balance since 1945/1946 (source: World Glacier Monitoring Service)



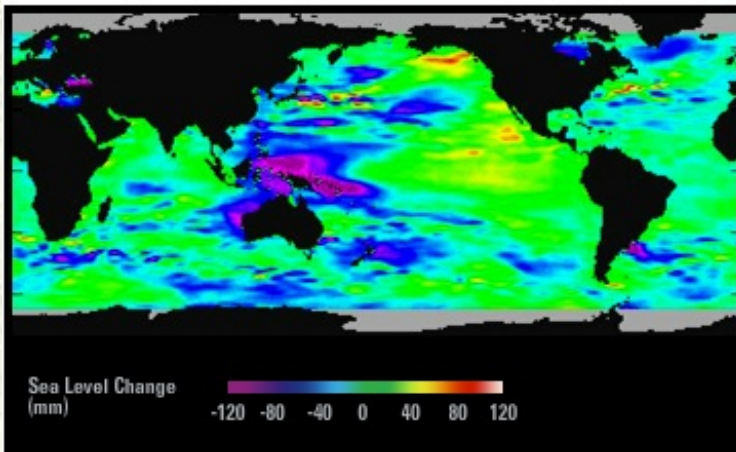
WMO 2013 The Global Climate 2001-2010



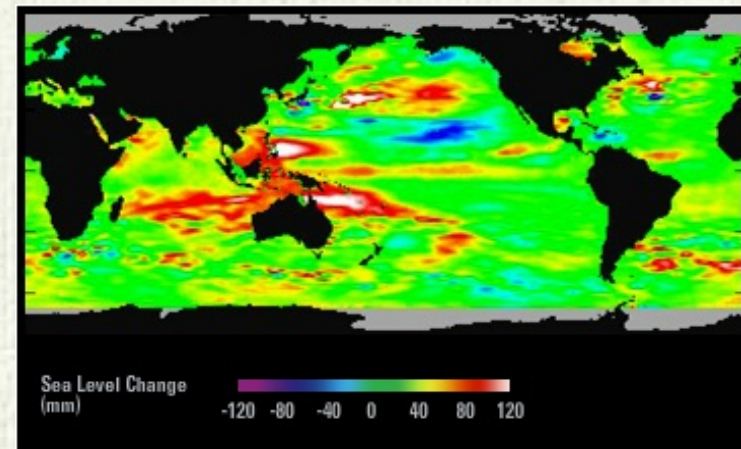
Sea Level Change



1993

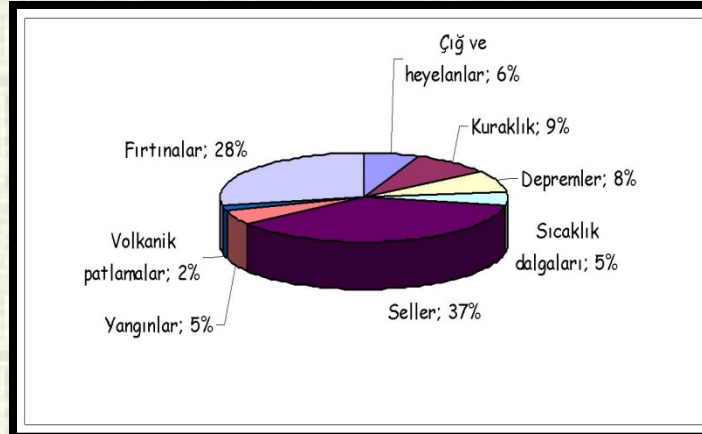
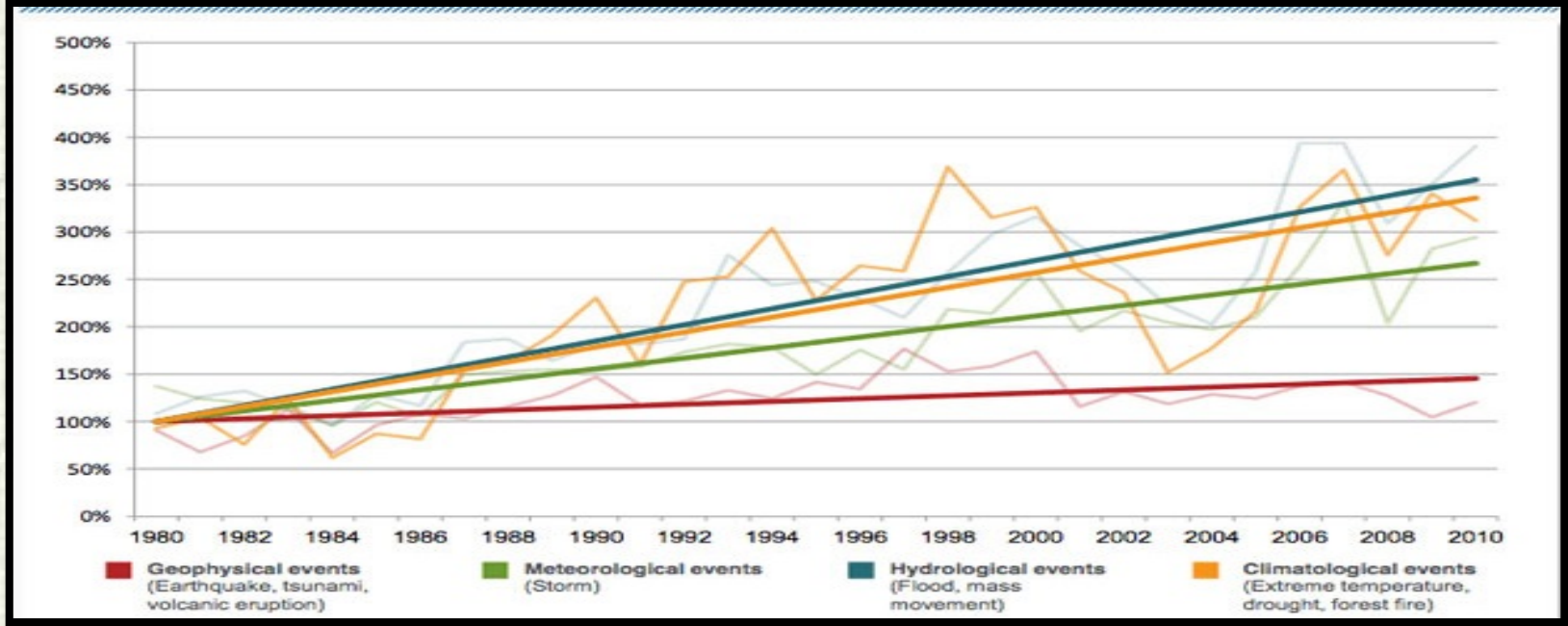


2009



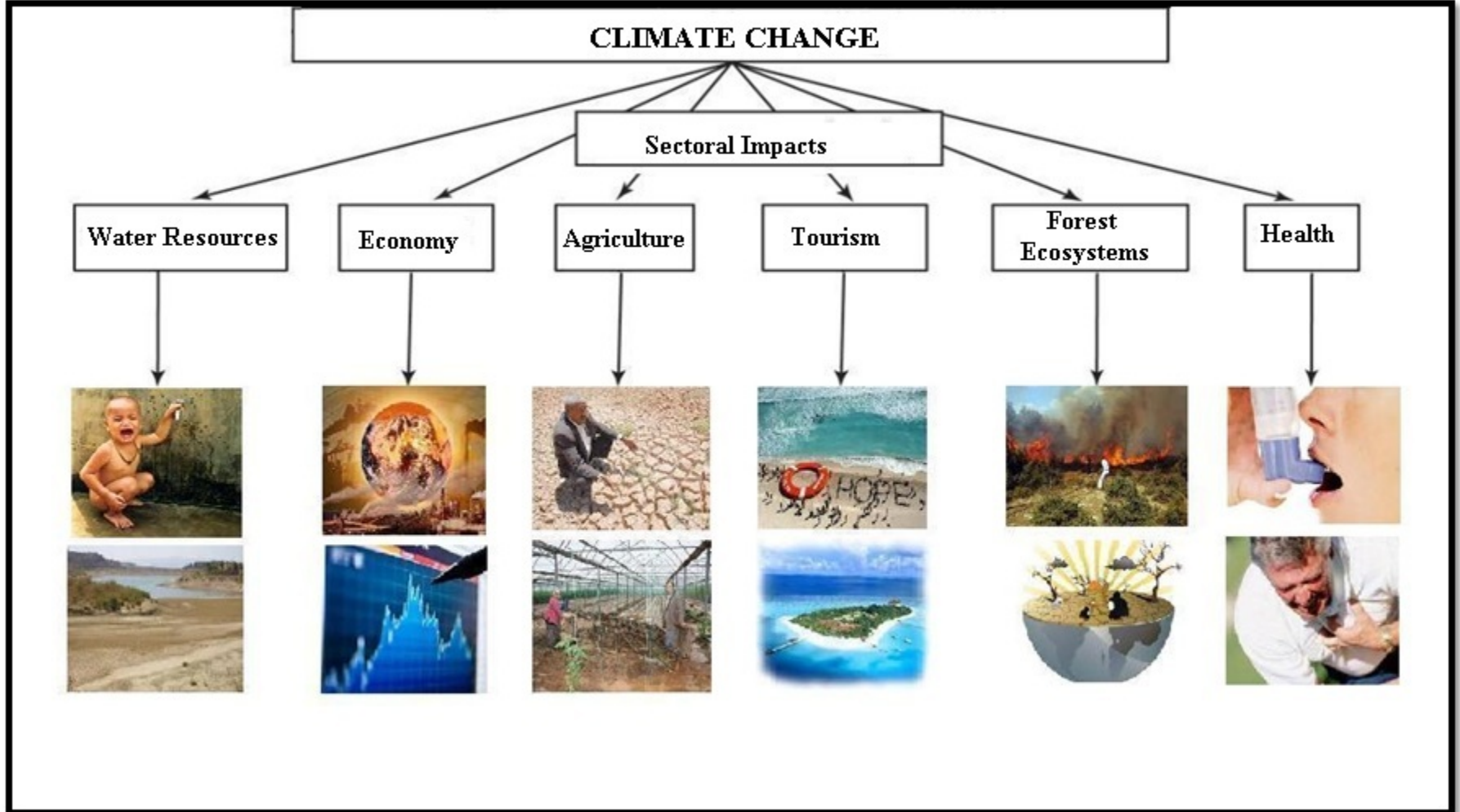


Extreme Events



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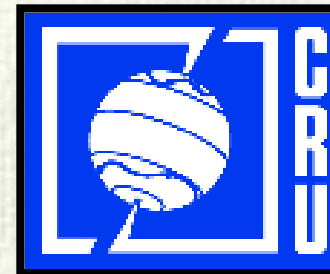
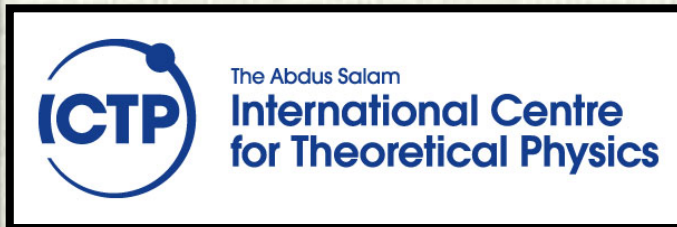


Regional Model Results



Models and Data sets

Global Model	Regional Model	Sensitivity Analysis Data	Period
HadGEM2-ES	RegCM4.3.4	<ul style="list-style-type: none"> • CRU (1971-2000) • UDEL (1971-2000) • UDEL-C (1971-2000) 	1971-2000 (RF) 2013-2099 (FTR)



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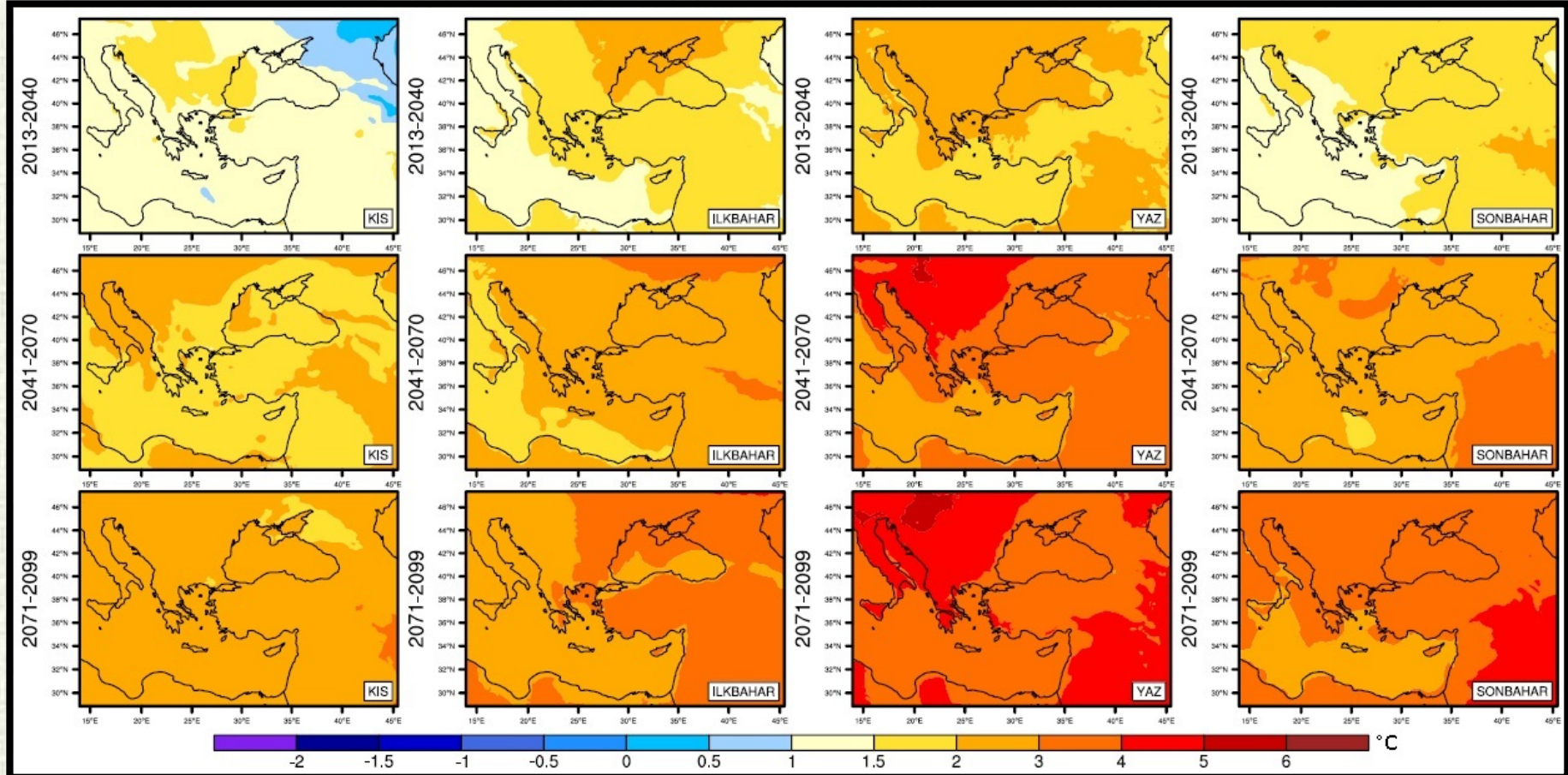
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Temperature and Precipitation Projections According to HadGEM2 RCP4.5 Scenario

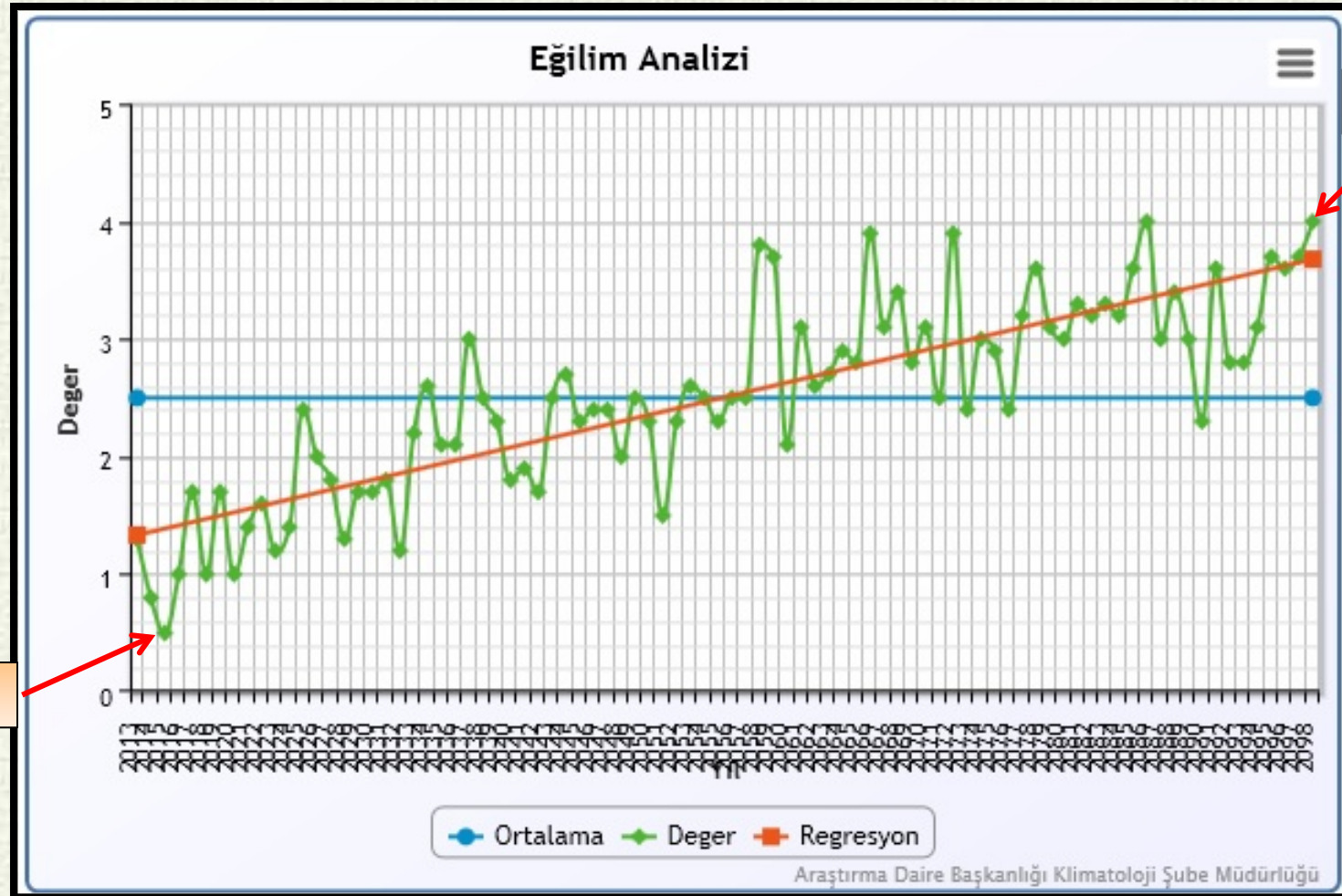


Temperature Projections According to RCP4.5 Scenario



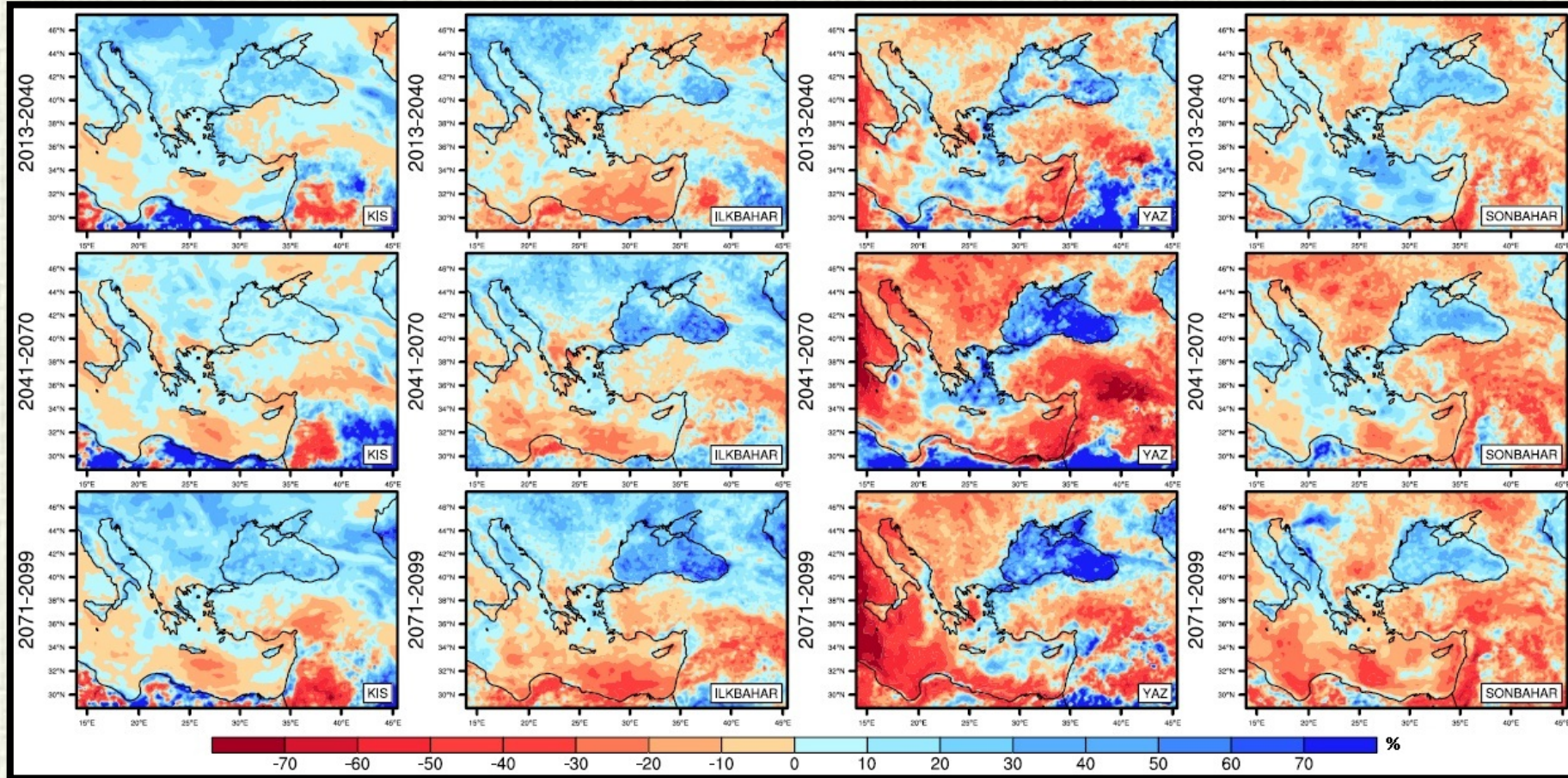


Trend Analysis of Annual Temperature



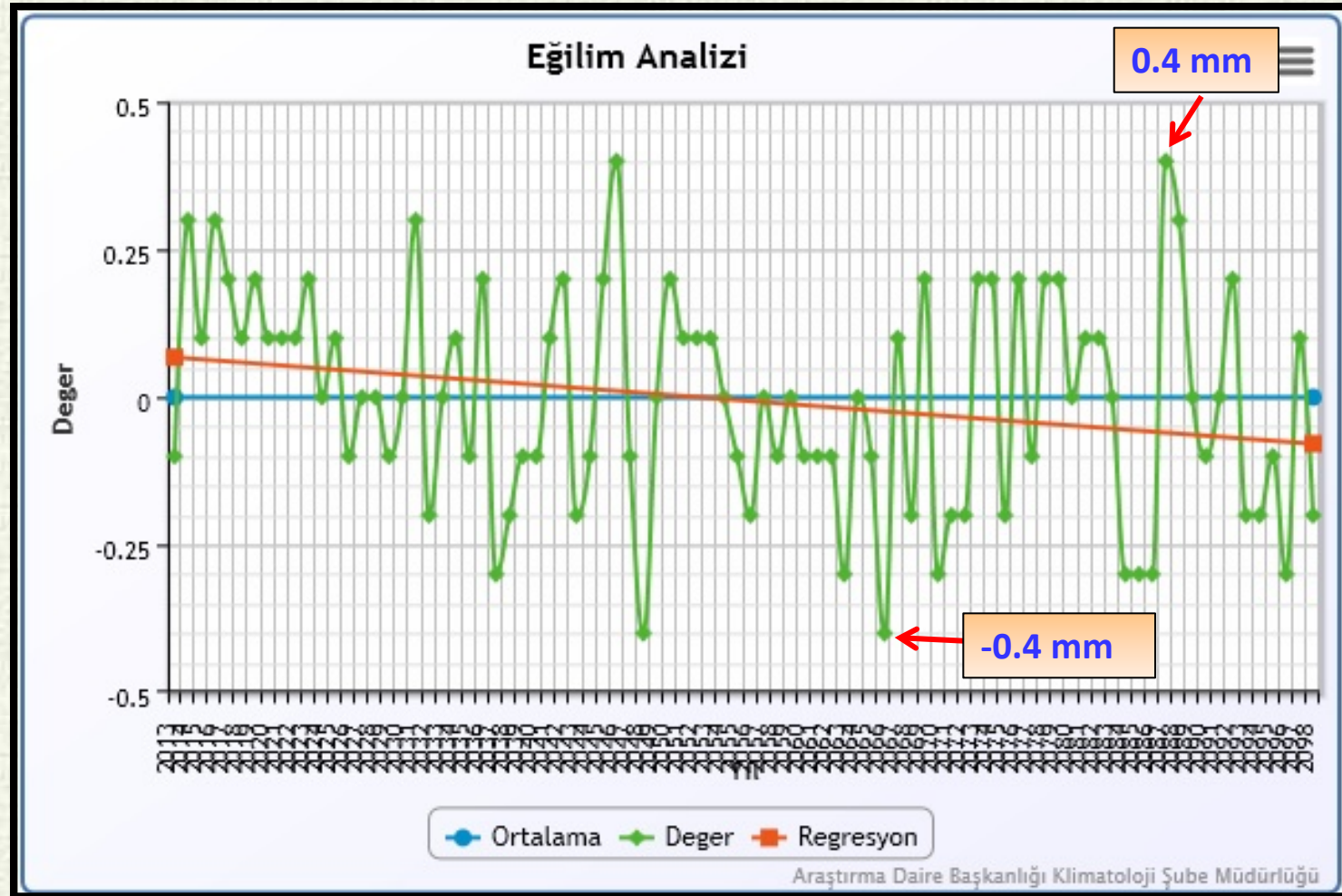


Precipitation Projections According to RCP4.5 Scenario



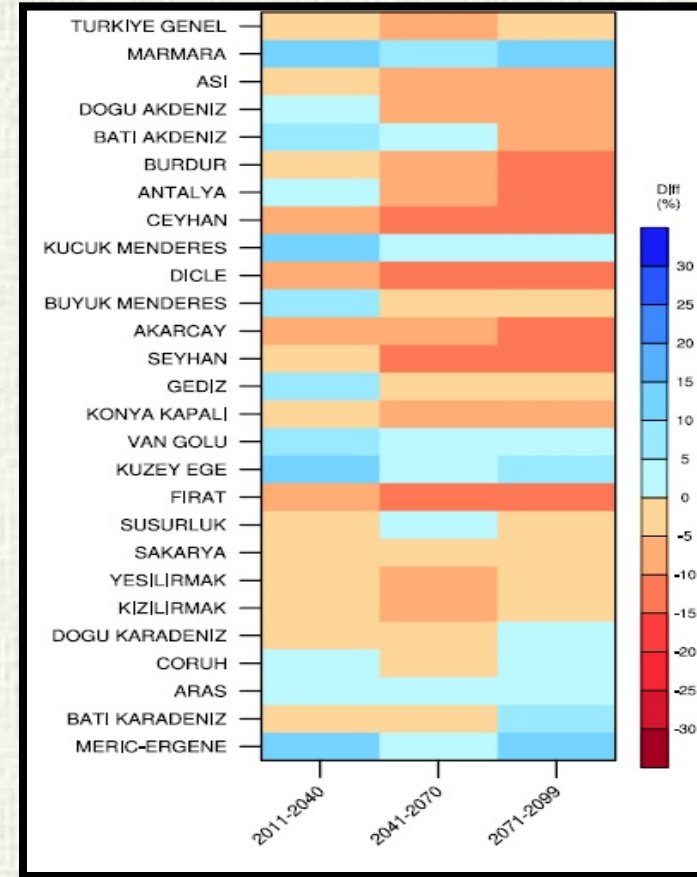
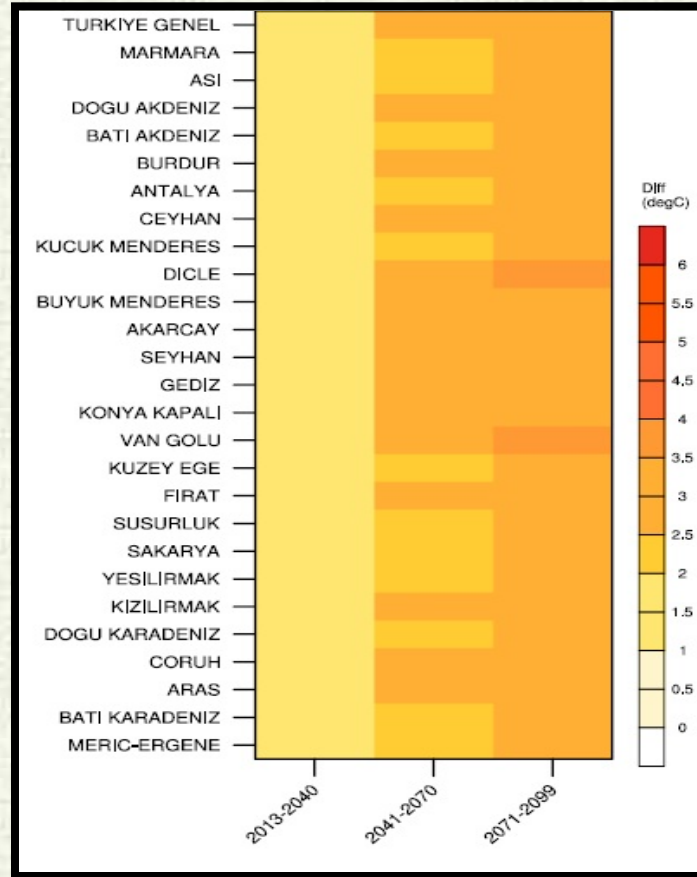


Trend Analysis of Precipitation





Watershed-Based Temperature and Precipitation Projections



This tables provides details to us that how will be affect each river basin.



Temperature Change (°C)			
	2013-2040	2041-2070	2071-2099
Dicle Basin	1.7	3.0	3.7
Fırat Basin	1.6	2.8	3.5

	Number of Days >25 °C			
	1971-2000	2013-2040	2041-2070	2071-2099
Dicle Basin	645	1423	1991	2055
Fırat Basin	269	869	1428	1531

Precipitation Change(%)			
Decrease	2013-2040	2041-2070	2071-2099
Dicle Basin	-7.1	-14.9	-13
Fırat Basin	-5.6	-12.1	-11.1
Ceyhan Basin	-7.8	-12.6	-14.8
Seyhan Basin	-2.6	-10.5	-11
Increase			
Marmara Basin	11.5	8.7	10.1
Meriç – Ergene Basin	12	3.1	12.8

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Meteoroloji Genel Müdürlüğü



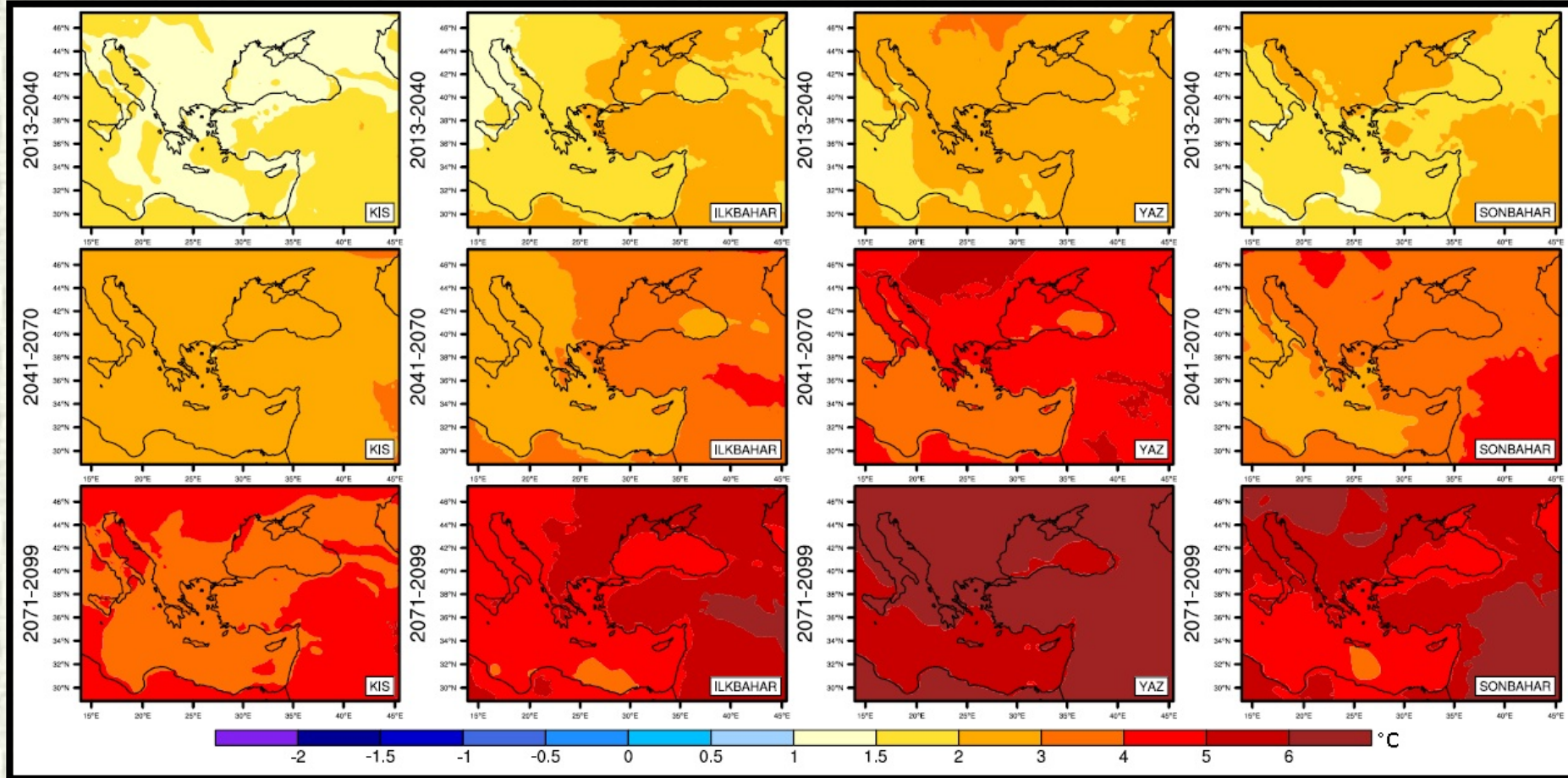
Temperature and Precipitation Projections According to HadGEM2 RCP8.5 Scenario

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Orman ve Su İşleri Bakanlığı
Meteoroloji Genel Müdürlüğü

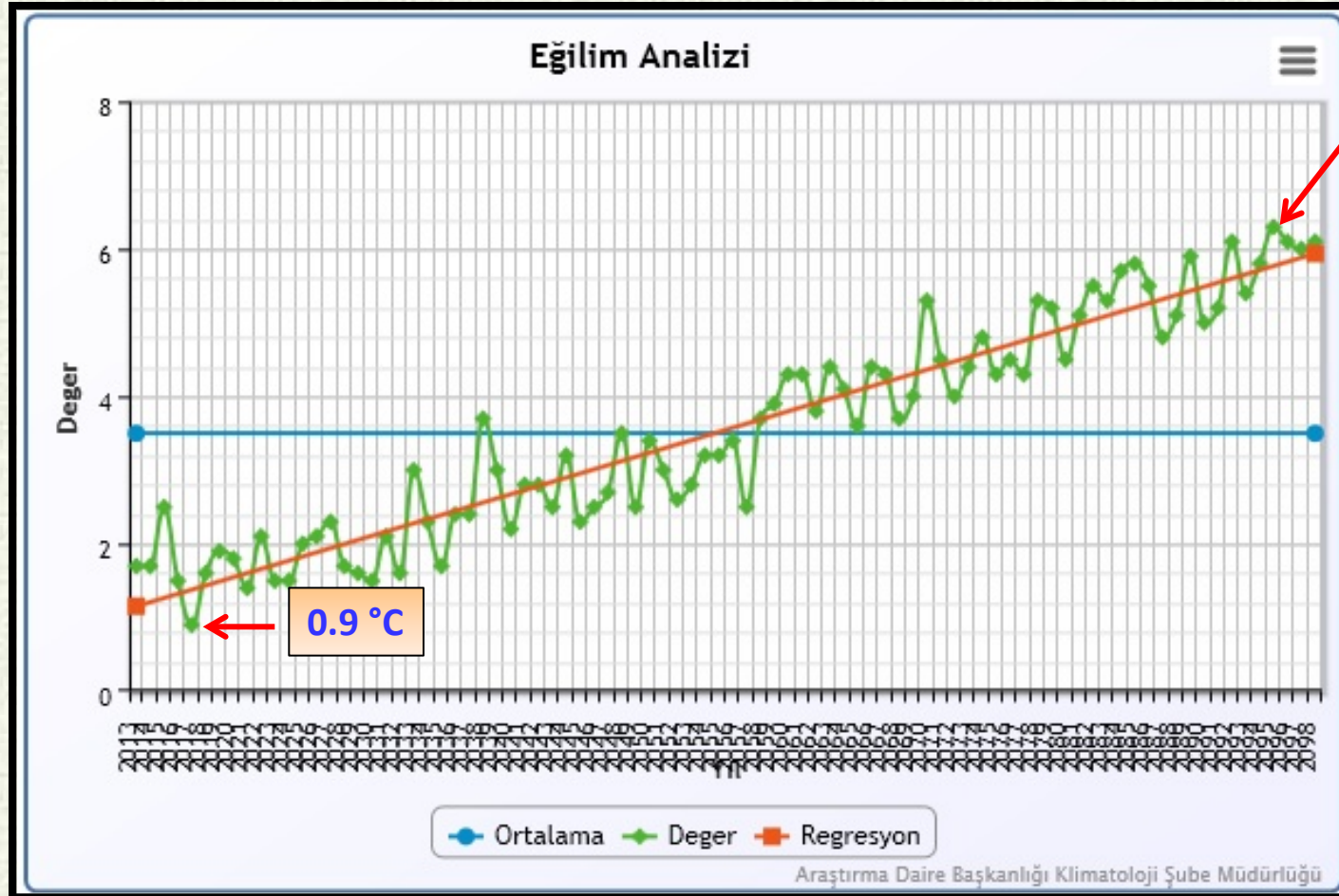


Temperature Projections According to RCP8.5 Scenario



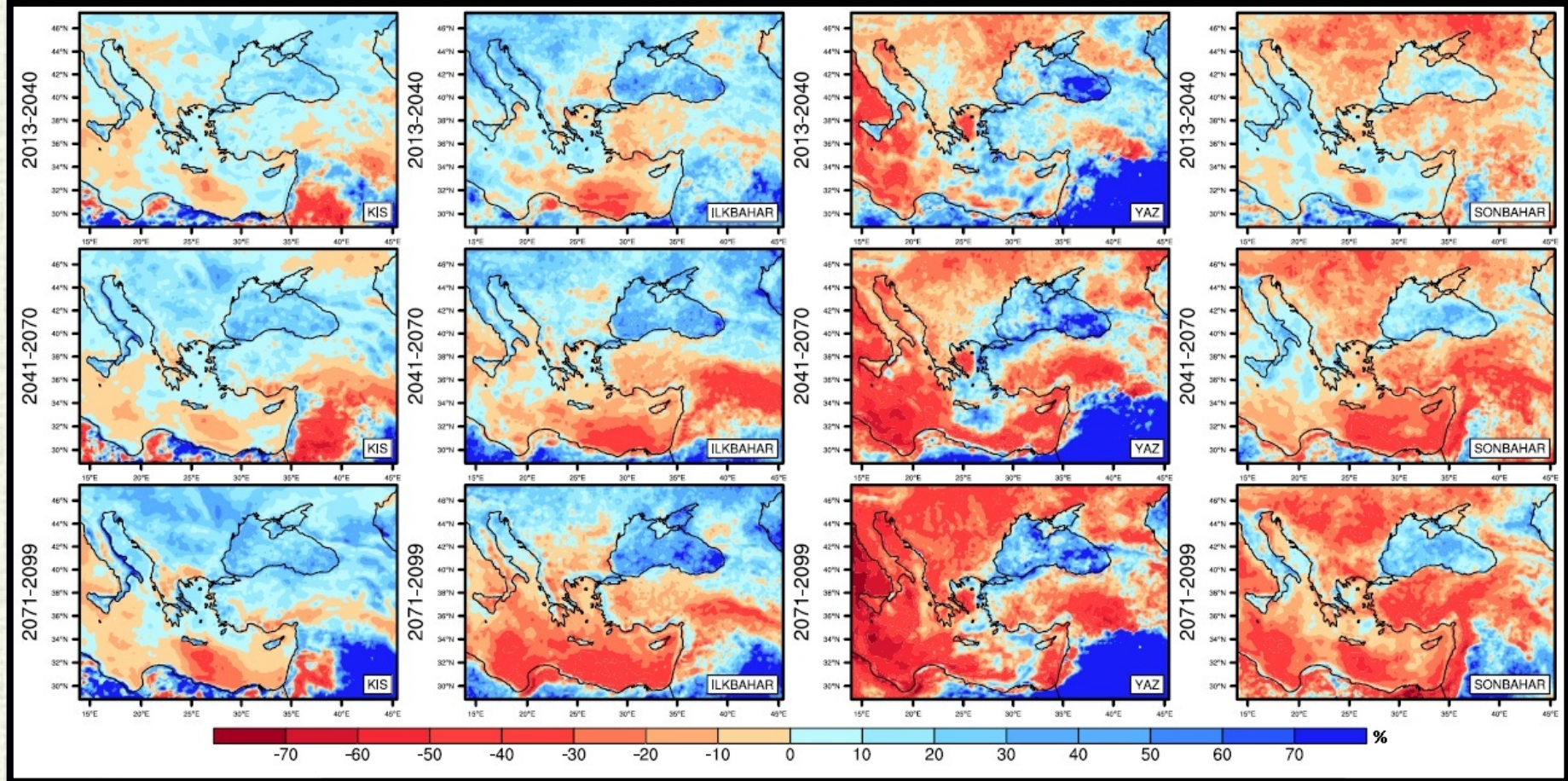


Trend Analysis of Annual Temperature



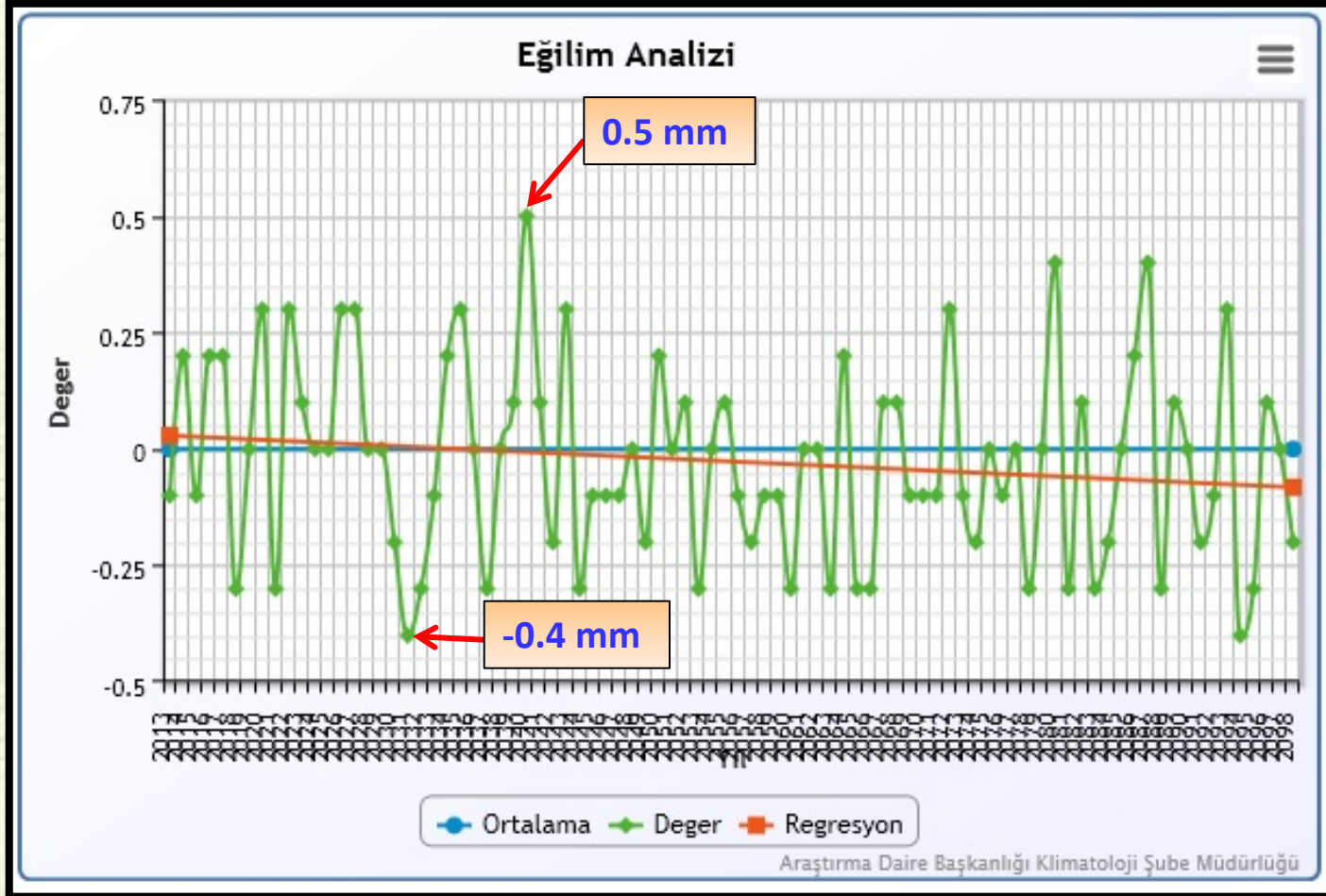


Precipitation Projections According to RCP4.5 Scenario



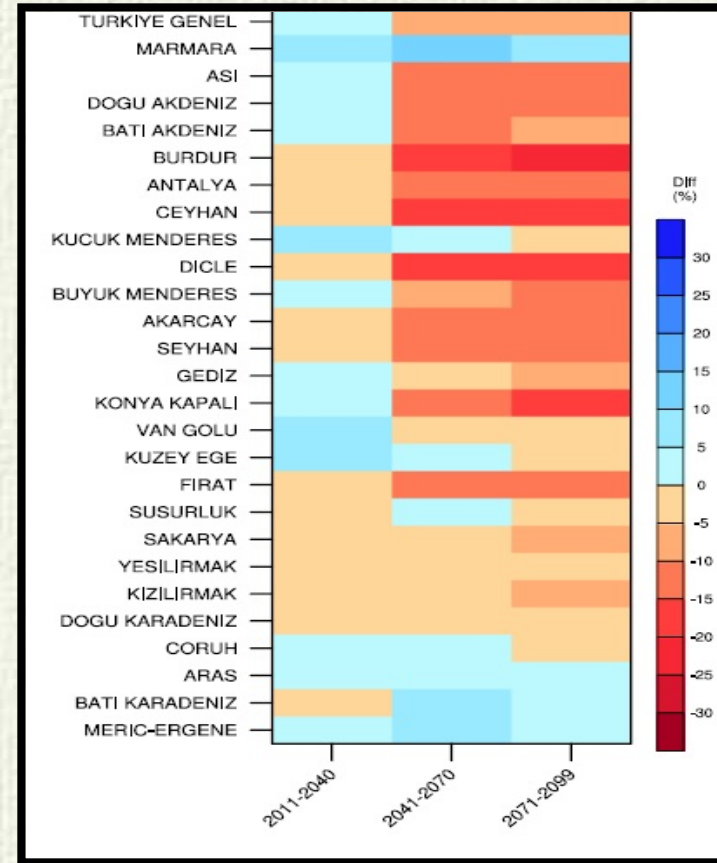
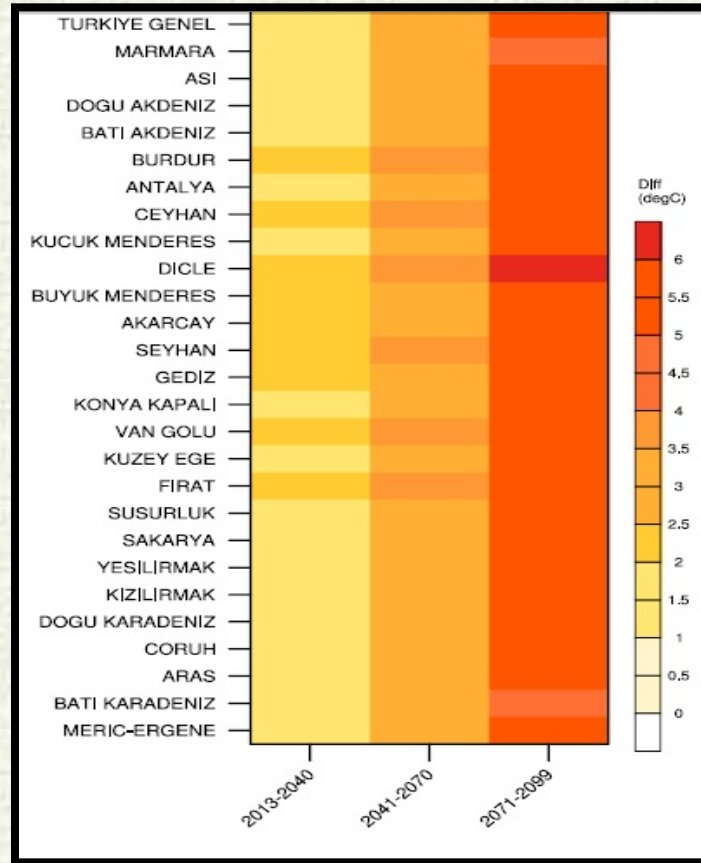


Trend Analysis of Precipitation





Watershed-Based Temperature and Precipitation Projections



This tables provides details to us that how will be affect each river basin.



Temperature Change (°C)			
	2013-2040	2041-2070	2071-2099
Dicle Basin	2.1	4.0	6.1
Fırat Basin	2.1	3.8	5.8

	Number of Days >25 °C			
	1971-2000	2013-2040	2041-2070	2071-2099
Dicle Basin	645	1458	2251	2489
Fırat Basin	269	951	1778	2239

Precipitation Change(%)			
	2013-2040	2041-2070	2071-2099
Decrease			
Dicle Basin	-4.0	-19.6	-17
Fırat Basin	-0.3	-13.6	-13.2
Ceyhan Basin	-3.7	-16.6	-17.2
Konya Kapalı Basin	0.2	-14.3	-15.7
Increase			
Marmara Basin	5.4	11.3	8.2

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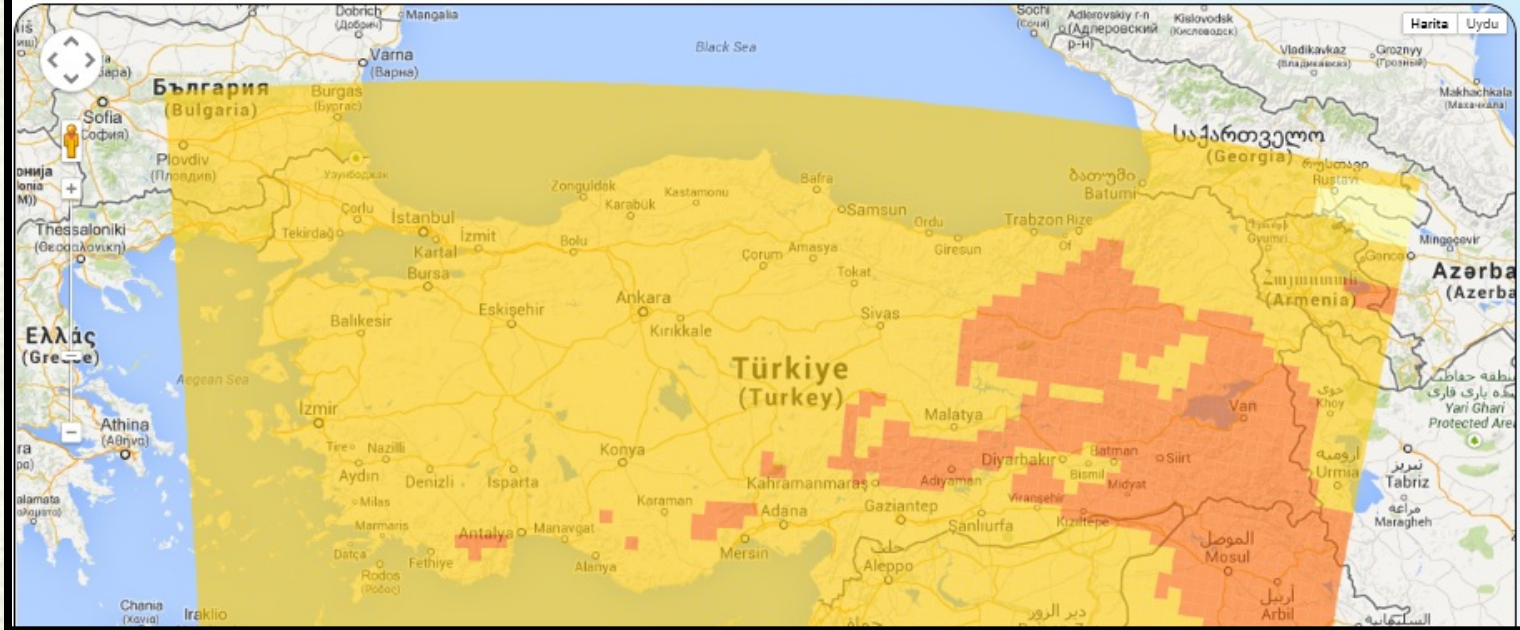
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METEOROLOJİ
GENEL MÜDÜRLÜĞÜ

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Renk Paleti	1 C aralıklı Sıcaklık <input type="text"/> <input type="button" value="Sorgula"/>



<http://212.175.180.216/model>

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Thank you

Teşekkürler

İletişim:

Meteoroloji Genel Müdürlüğü

Araştırma Dairesi Başkanlığı

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