

## **Position Papers of Climate Modelling Regional Climate Projections of Turkey**



**Division of Research  
Department of Climatology**

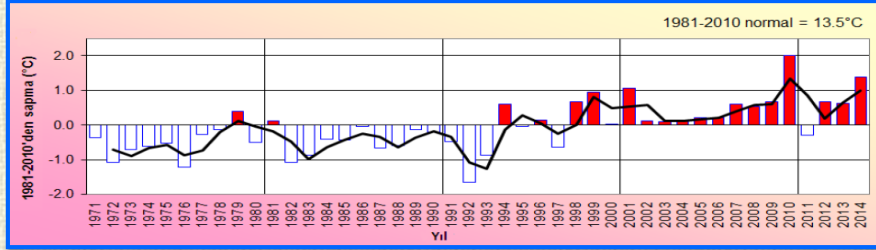
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## **Content**

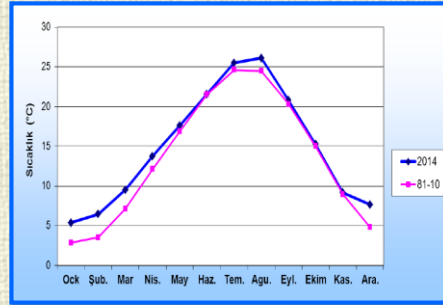
- 1. Global and Local changes in climate**
- 2. Models and Data**
- 3. Parametrisations**
- 4. Temperatur and Precipitation projections based on RCP4.5 and RCP8.5 Scenarios**
- 5. Lessons**
- 6. Interface for low and middle level users**

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## Türkiye İçin Sıcaklık Değerlendirmesi



In 2014 mostly in first 4 months, in 105 stations, heat waves were observed, in 12 stations, both heat and cold waves were observed.



In 2014, 34 stations broke their own maximum temperature records.

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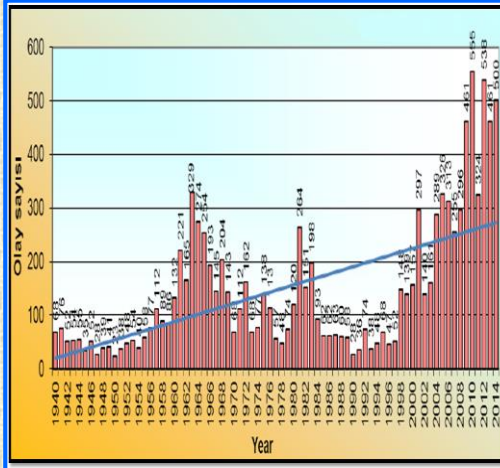
## Annual Terrestrial Precipitation Anomaly



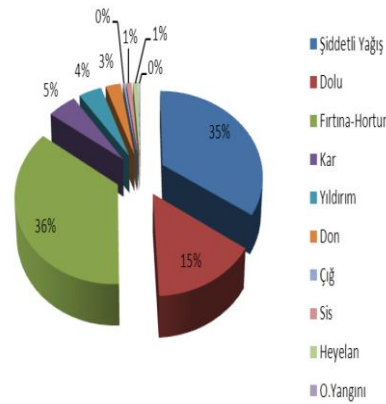
Long Term Mean: around 570 mm

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## Extrem Events



2014 Meteorolojik Karakterli Ekstrem Olaylar



In 2014, 500 Meteorological exrem events observed. %36 of them comes from storm-tornado

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## Models and Data Sets

Global Moels (GCMs)	HadGEM2-ES	MPI-ESM-MR	GFDL-ESM2M
Resolutions (km)	112,5	210	220
Institute	Hadley Center GB	Max Planck Germany	NOAA-GFD Labaratuury USA
Scenarios	RCP4.5-RCP8.5	RCP4.5-RCP8.5	RCP4.5-RCP8.5
Reference Period	1971-2000	1971-2000	1971-2000
Projection Period	2016-2099	2016-2099	2016-2099
Regional Models (RCMs)	RegCM4.3.4.	RegCM4.3.4.	RegCM4.3.4.
RCM resolutions (km)	20	20	20
Current State	Completed	Completed	Completed

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## 4- Regional Climate Projections

### Projection maps settlement plan

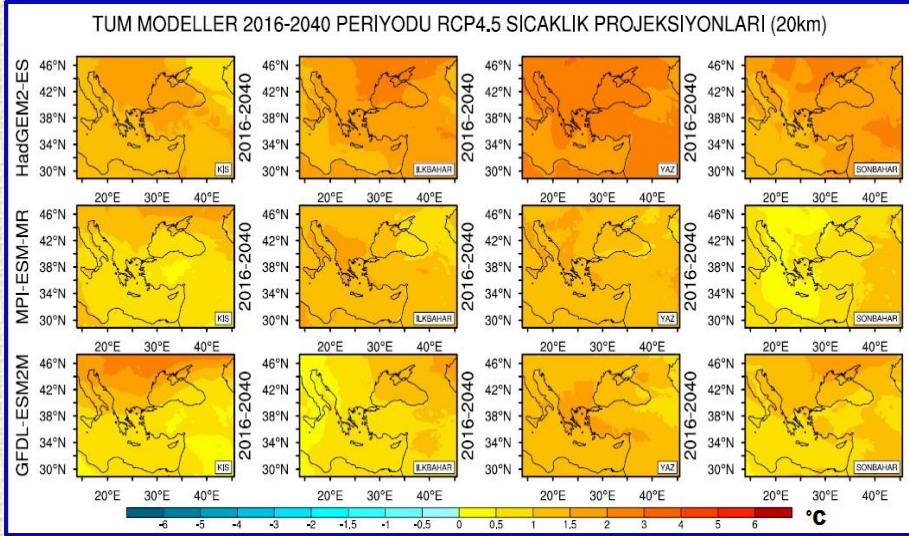
	winter	spring	summer	autumn
GCM1				
GSM2				
GCM3				

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## RCP4.5-Temperature projections

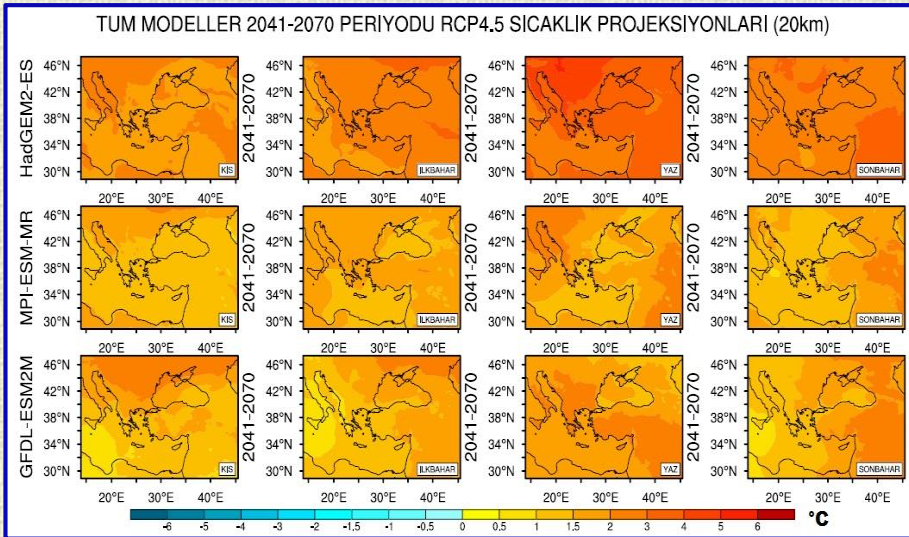
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## 2016-2040 Period (1. period)



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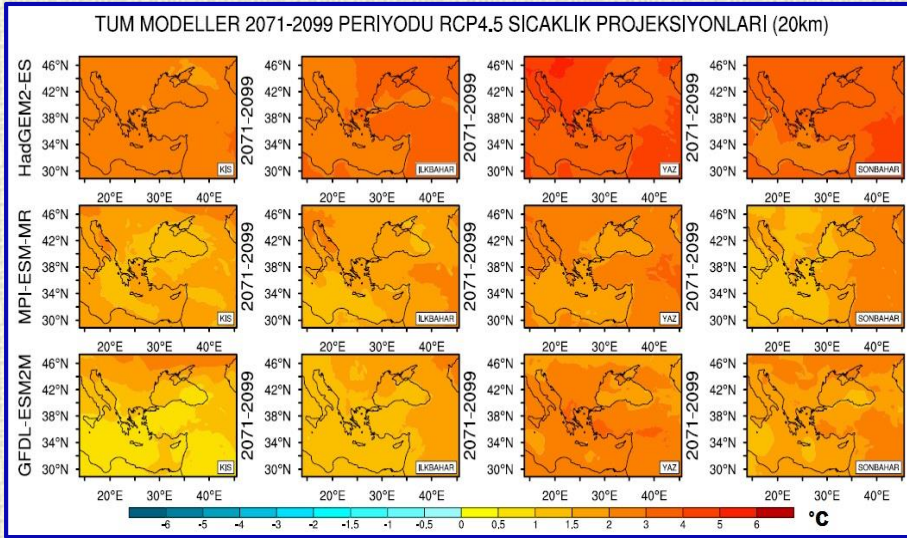
## 2041-2070 Period (2. period)



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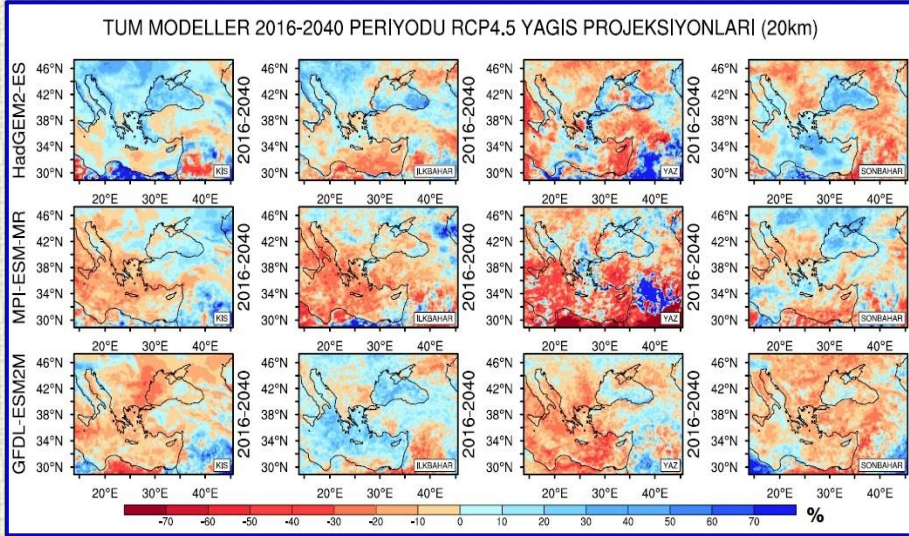
## 2071-2099 Period (3. period)



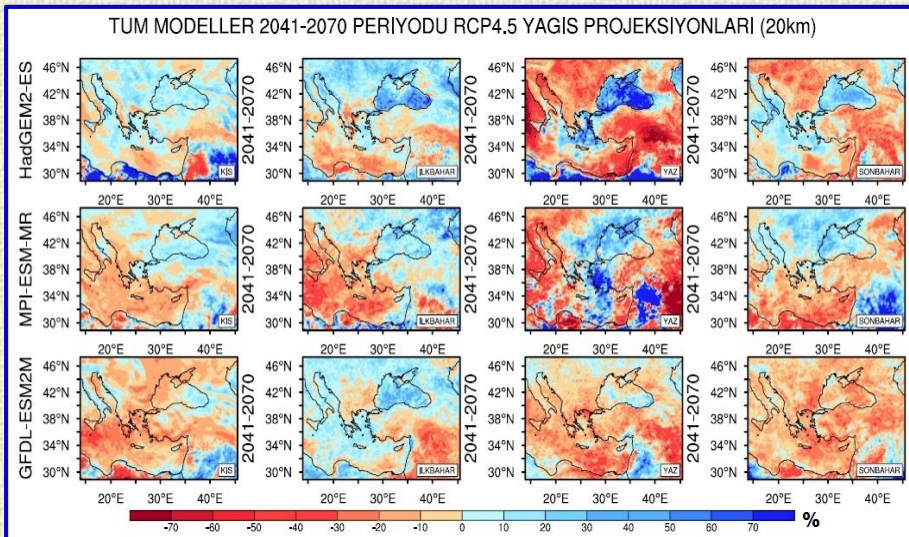
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## RCP4.5 – Precipitation Projections

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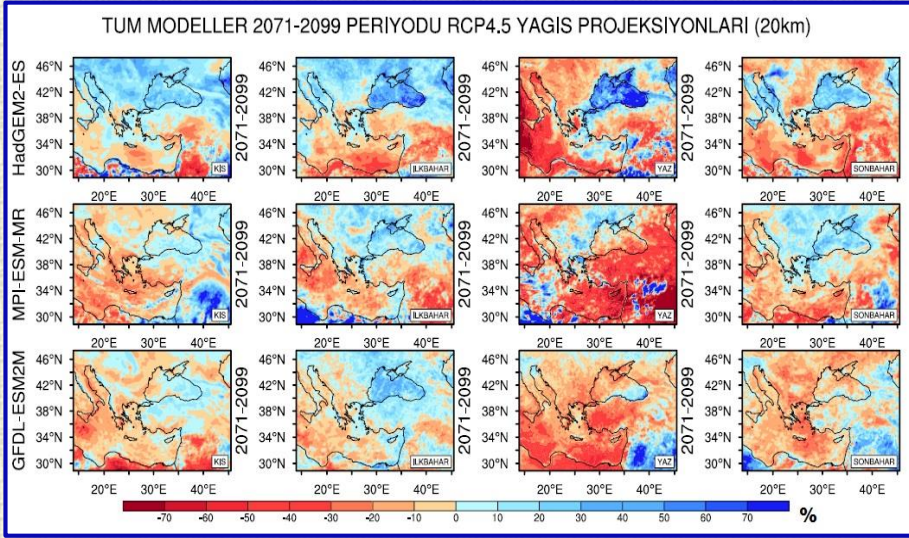


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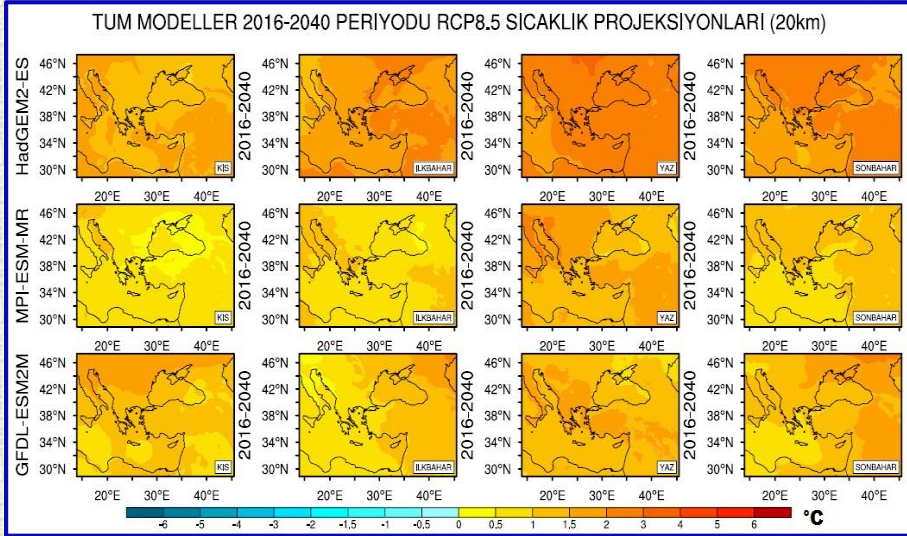
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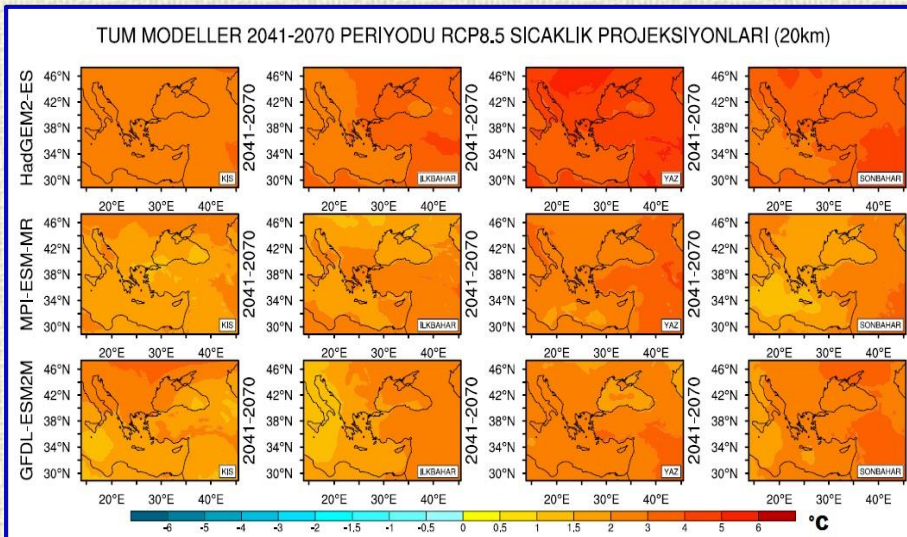


## RCP8.5 Senaryosuna Göre Sıcaklık Projeksiyonları

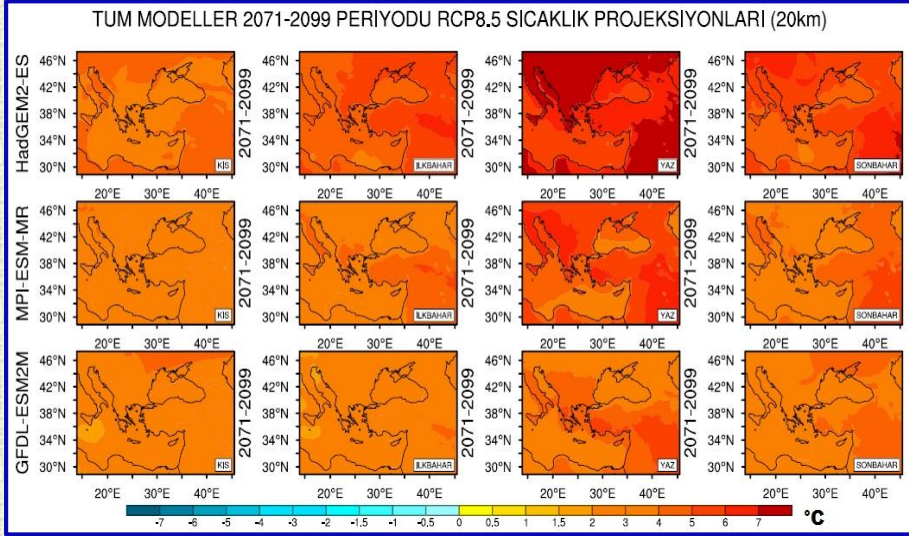




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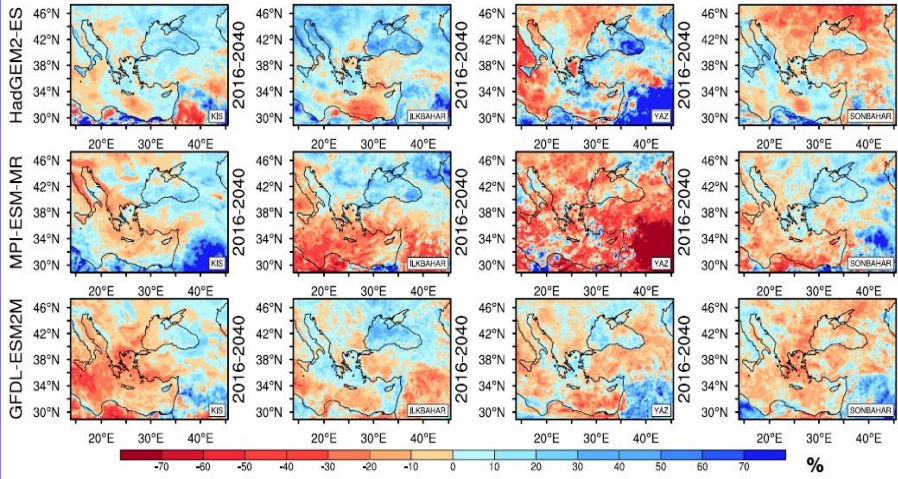
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## RCP8.5 Senaryosuna Göre Yağış Projeksiyonları

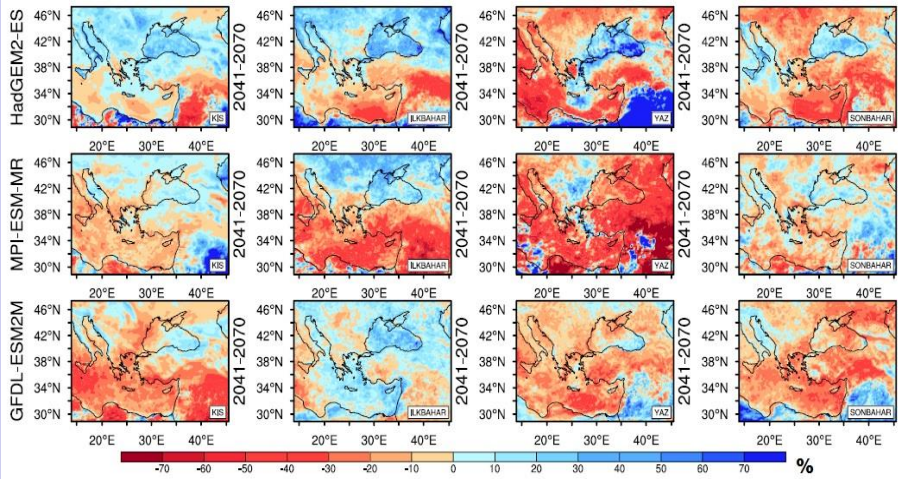


TUM MODELLER 2016-2040 PERİYODU RCP8.5 YAGIS PROJEKSİYONLARI (20km)

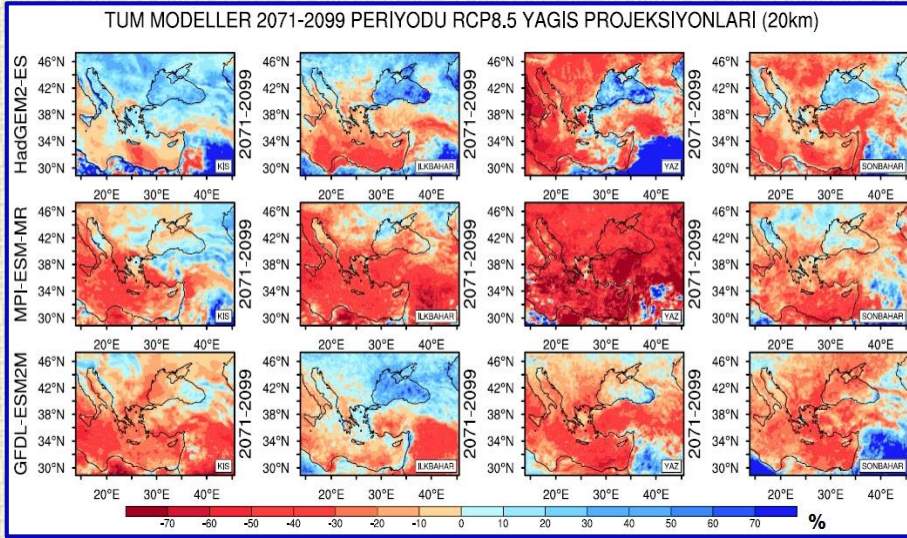


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TUM MODELLER 2041-2070 PERİYODU RCP8.5 YAGIS PROJEKSİYONLARI (20km)



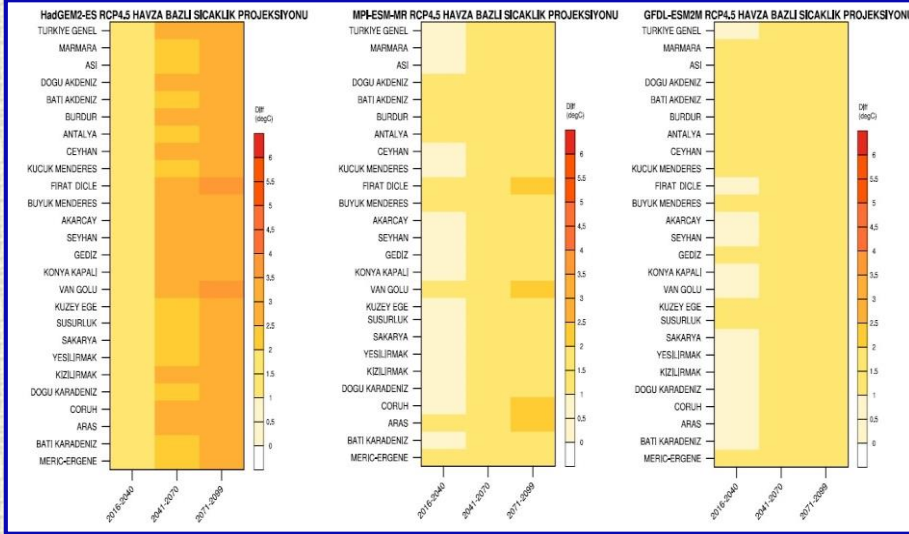
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## RCP4.5 Temperature and Precipitation Projections based on river BASINS

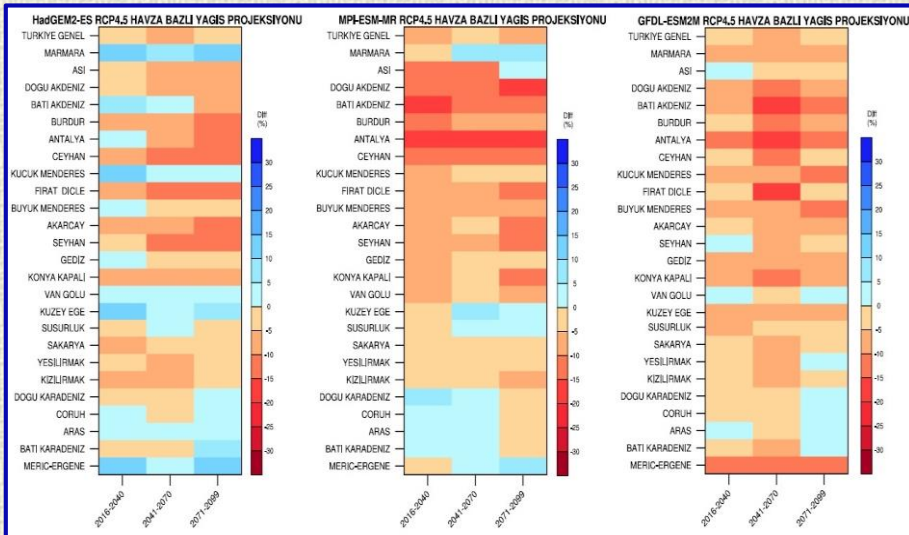


## RCP4.5 Temperature



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## RCP4.5 Precipitation

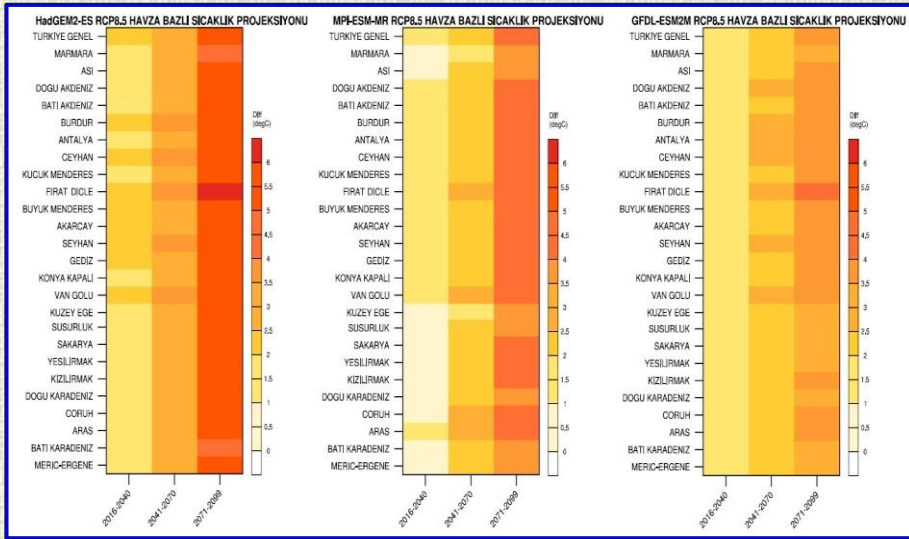


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## RCP8.5 Temperature and Precipitation Projections based on river BASINs

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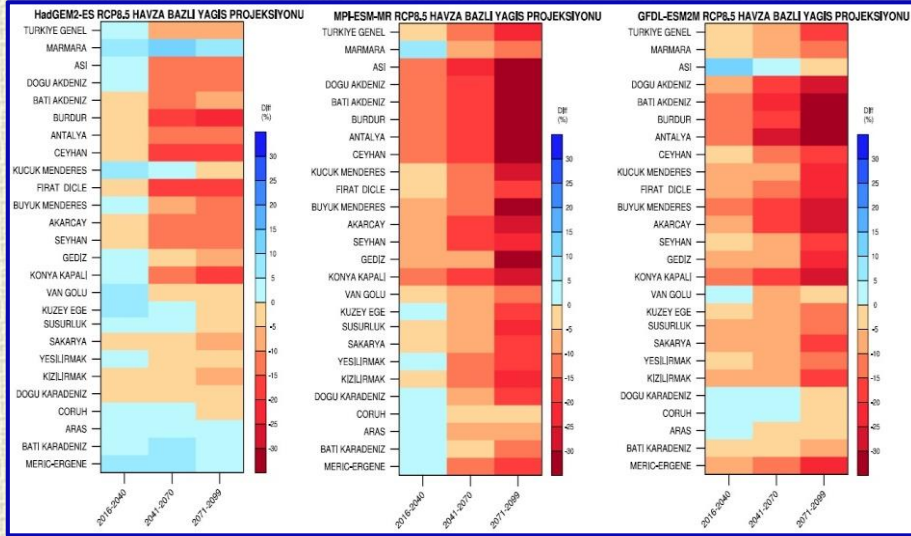
## RCP8.5 Temperature



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## RCP8.5 Precipitation

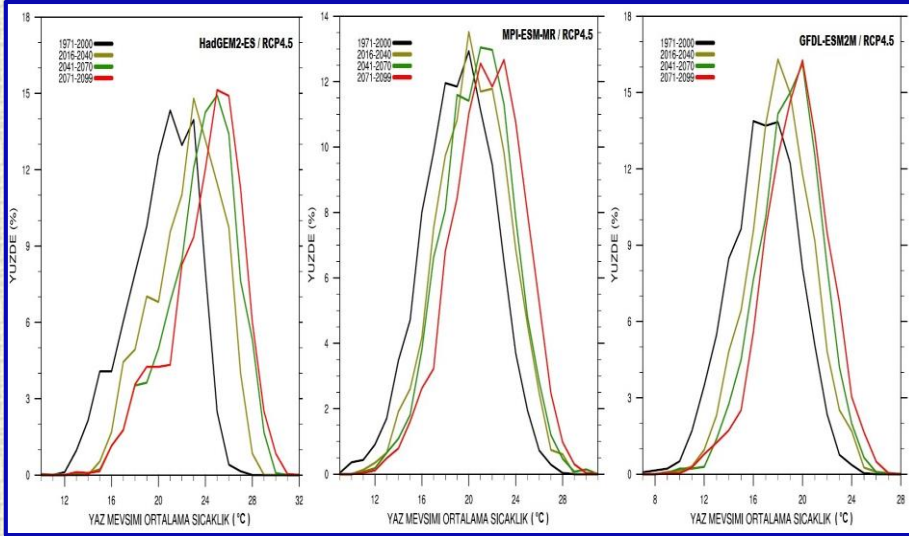


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## Summer Season Mean Temperaure Shifting Charts

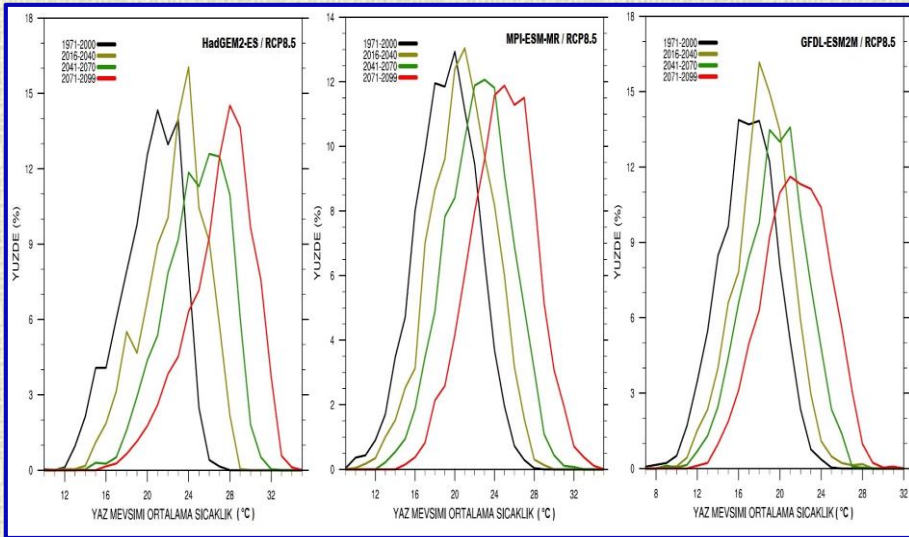
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## How summer season shifting (RCP4.5)



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## RCP8.5 Senaryosuna Göre Türkiye Geneli Yaz Mevsimi Ortalama Sıcaklık Grafikleri



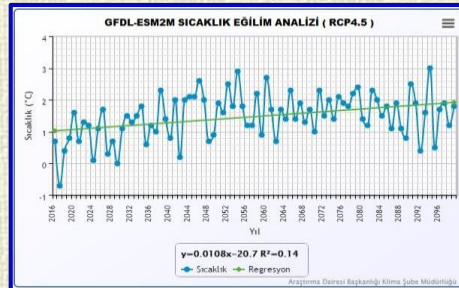
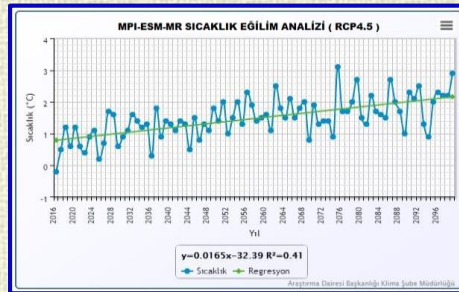
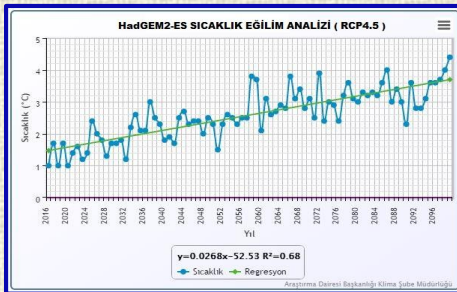
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## RCP4.5 and RCP8.5 Trend Analysis

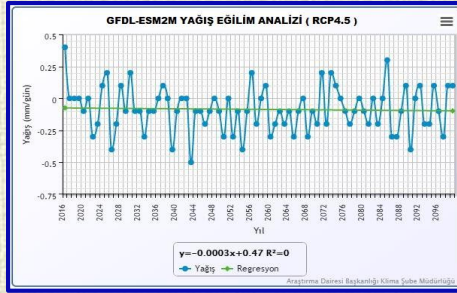
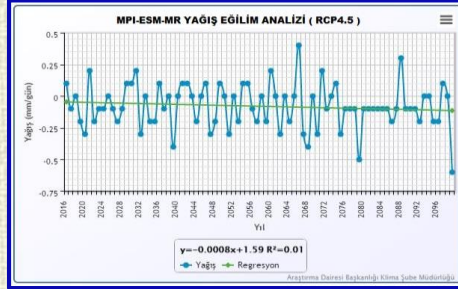
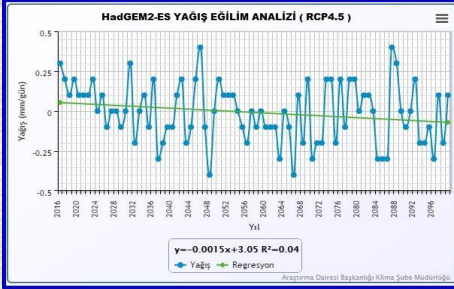
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## RCP4.5 Temperature



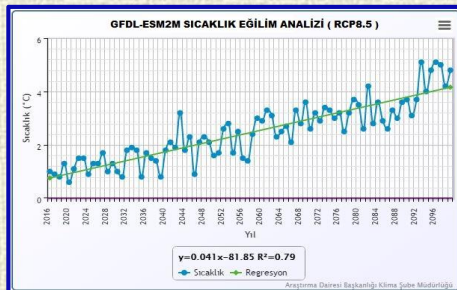
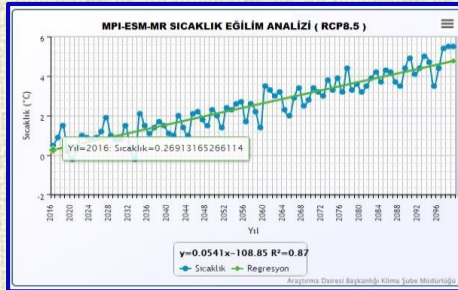
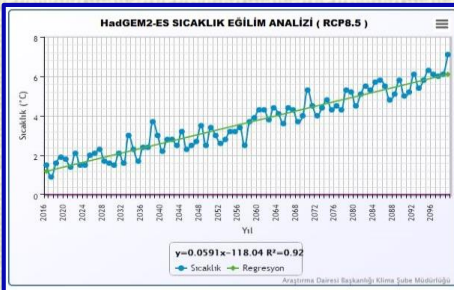
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## RCP4.5 Precipitation



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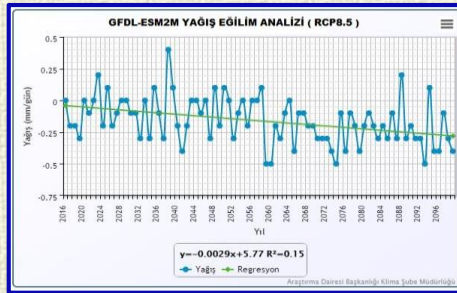
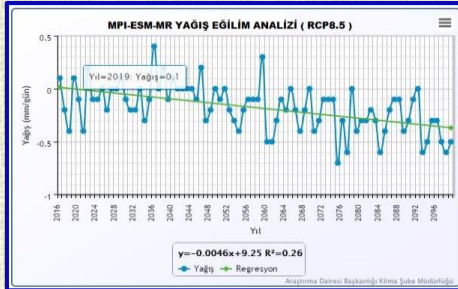
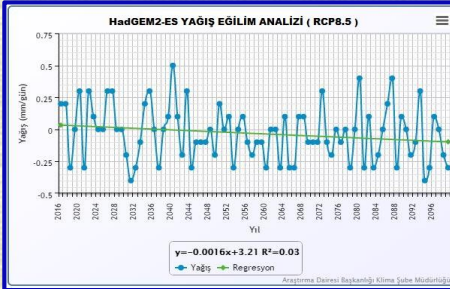
## RCP8.5 Temperature



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## RCP8.5 Precipitation



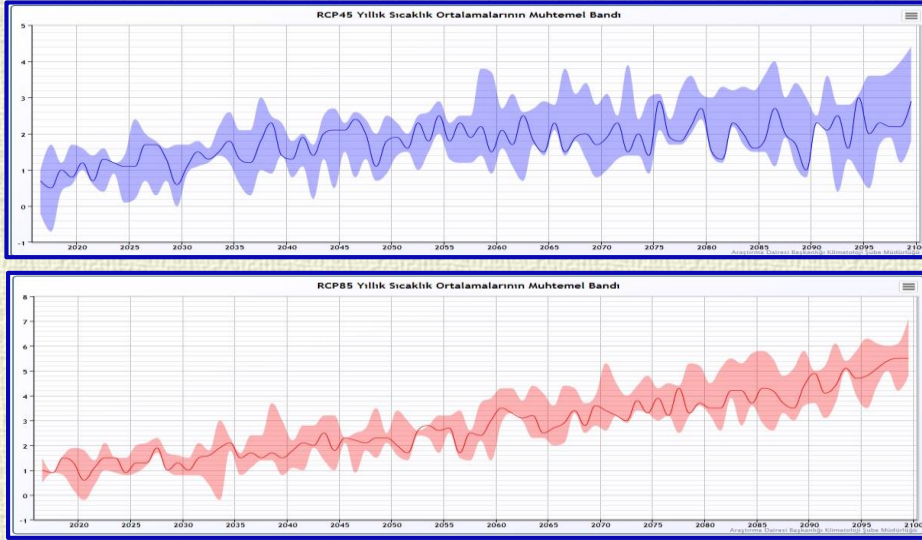
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## RCP4.5 and RCP8.5 Scenarios Probability Charts

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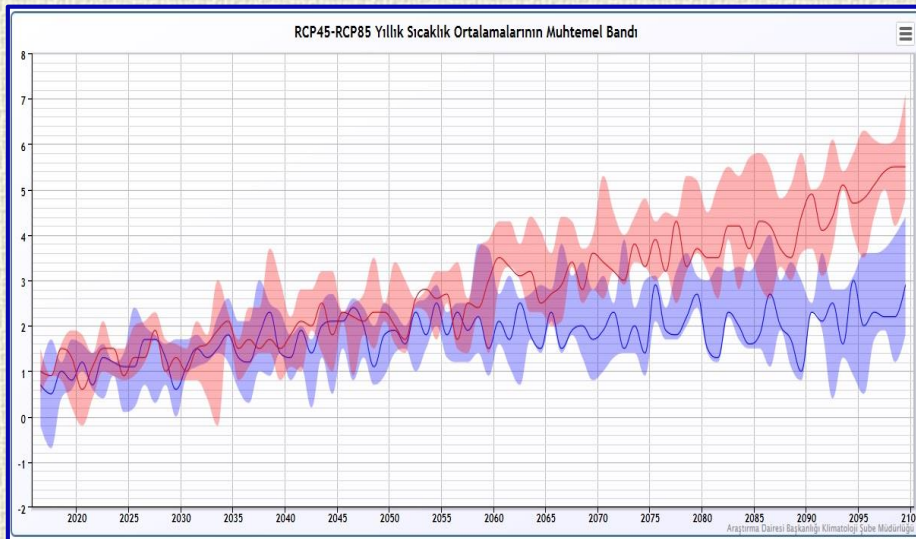
## RCP4.5 and RCP8.5 Scenarios Mean Temperature Probability Chart



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## RCP4.5 and RCP8.5 Scenarios Mean Temperature Probability Chart



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## 5- LESSONS

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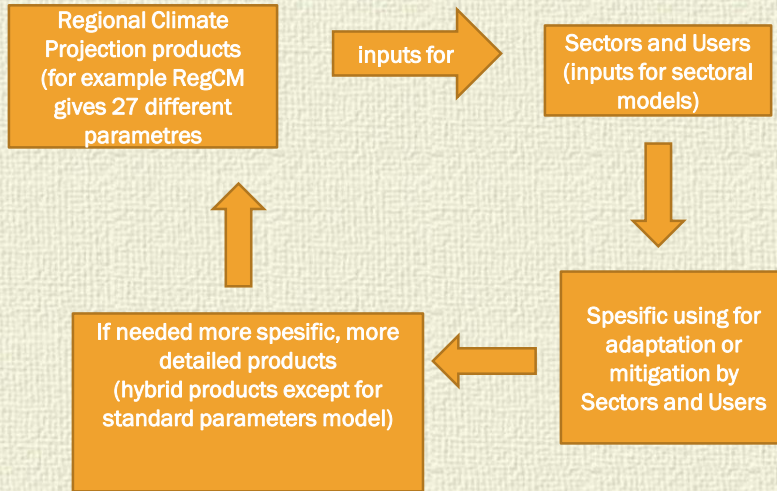
1. Projections shows that Turkey is vulnerable to warming. (In particular in 3.period /2071-2099)
2. Mean temperature rising for Turkey in 2016-2099 period ;  
RCP4.5: 2-3°C,  
RCP8.5: 3-4°C
3. Although a general small portion decreasing is projected., there is no regular trend for precipitation. In terms of variability, in some periods annual total precipitation increases 140-150 mm, in some periods decreases 240-250 mm..

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# Thanks for Attention!

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Devision of Research

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