



“Κλιματική αλλαγή - τα  
νέα δεδομένα ”

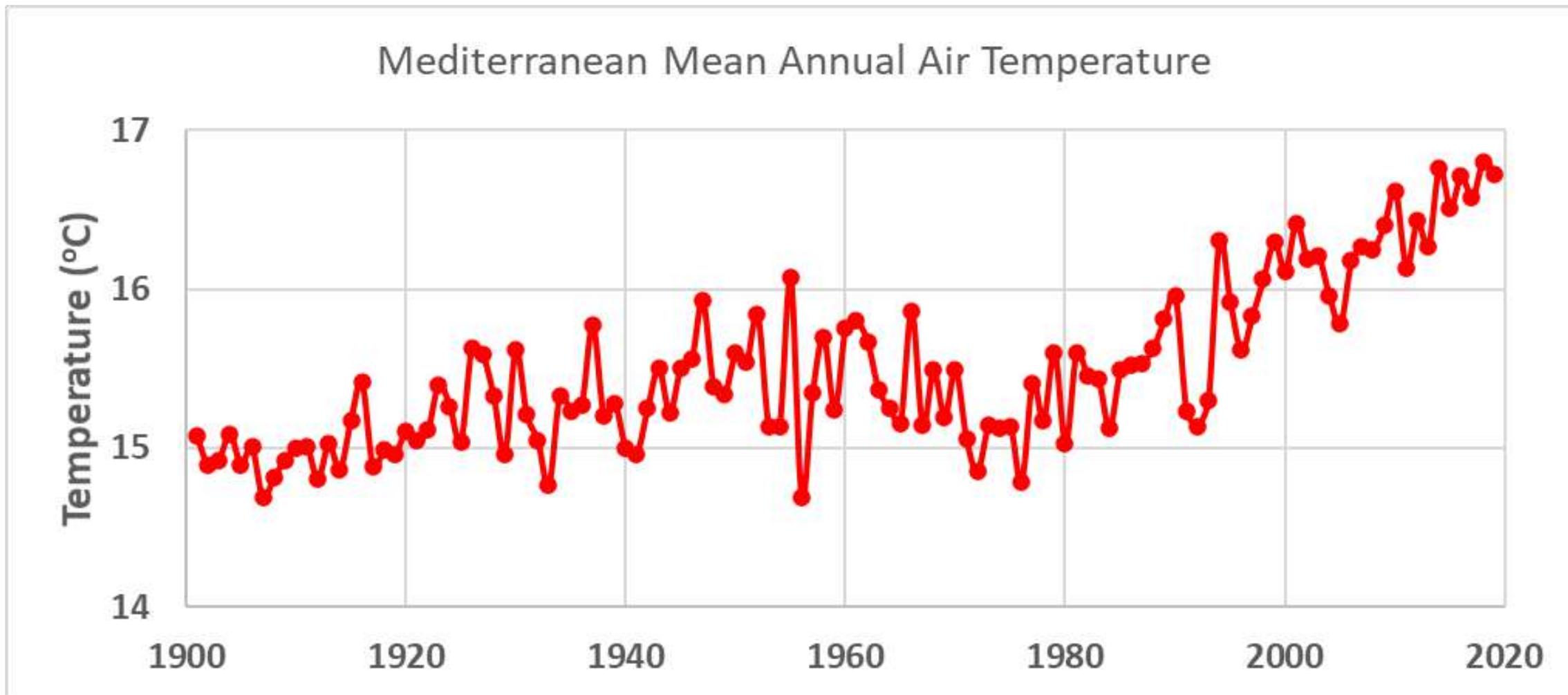
Χρήστος Ζερεφός,

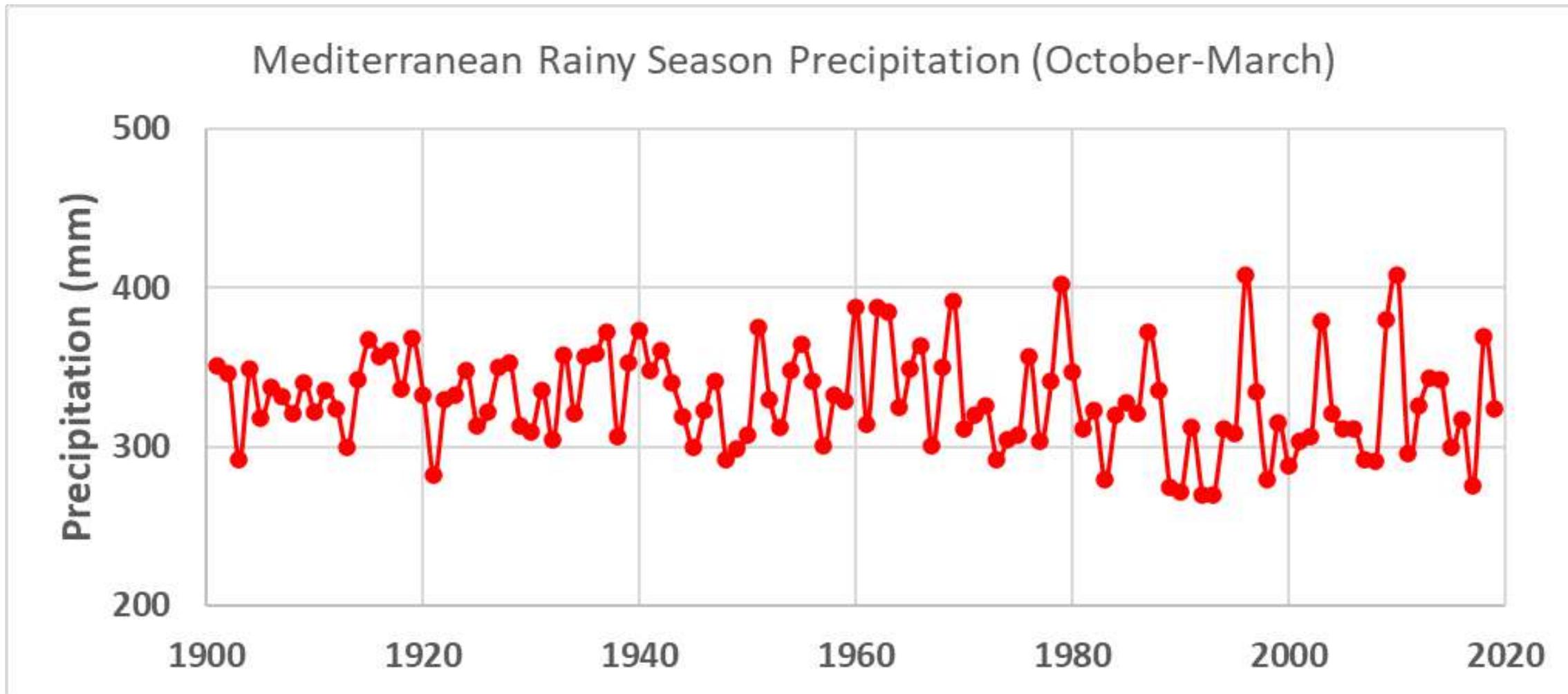
Εθνικός Εκπρόσωπος για την Κλιματική Αλλαγή

Γενικός Γραμματέας της Ακαδημίας Αθηνών

*Εξειδικευμένα Εκπαιδευτικά Εργαστήρια Ανάπτυξης Δεξιοτήτων  
σε θέματα εξοικονόμησης ενέργειας και περιβαλλοντικής διαχείρισης  
στον ξενοδοχειακό τομέα της Ελλάδας & Κύπρου*

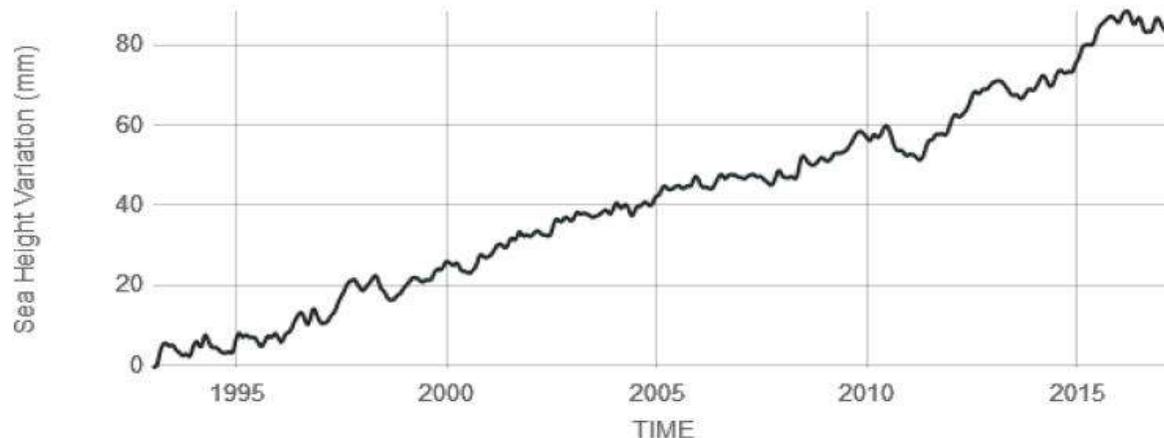
*ΠΡΩΤΗ ΕΝΟΤΗΤΑ - ΚΛΙΜΑΤΙΚΗ ΑΛΛΑΓΗ - ΤΑ ΝΕΑ ΔΕΔΟΜΕΝΑ - 9/3/2021*



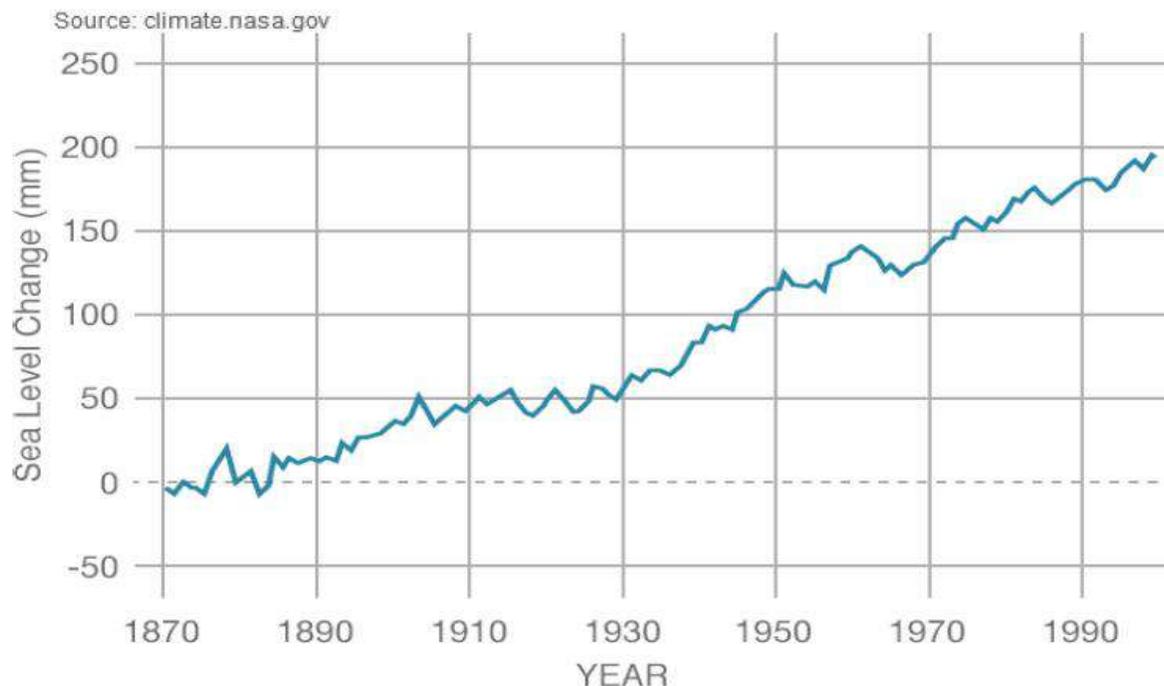


## Global sea level rise: + 26 cm 1870-2017

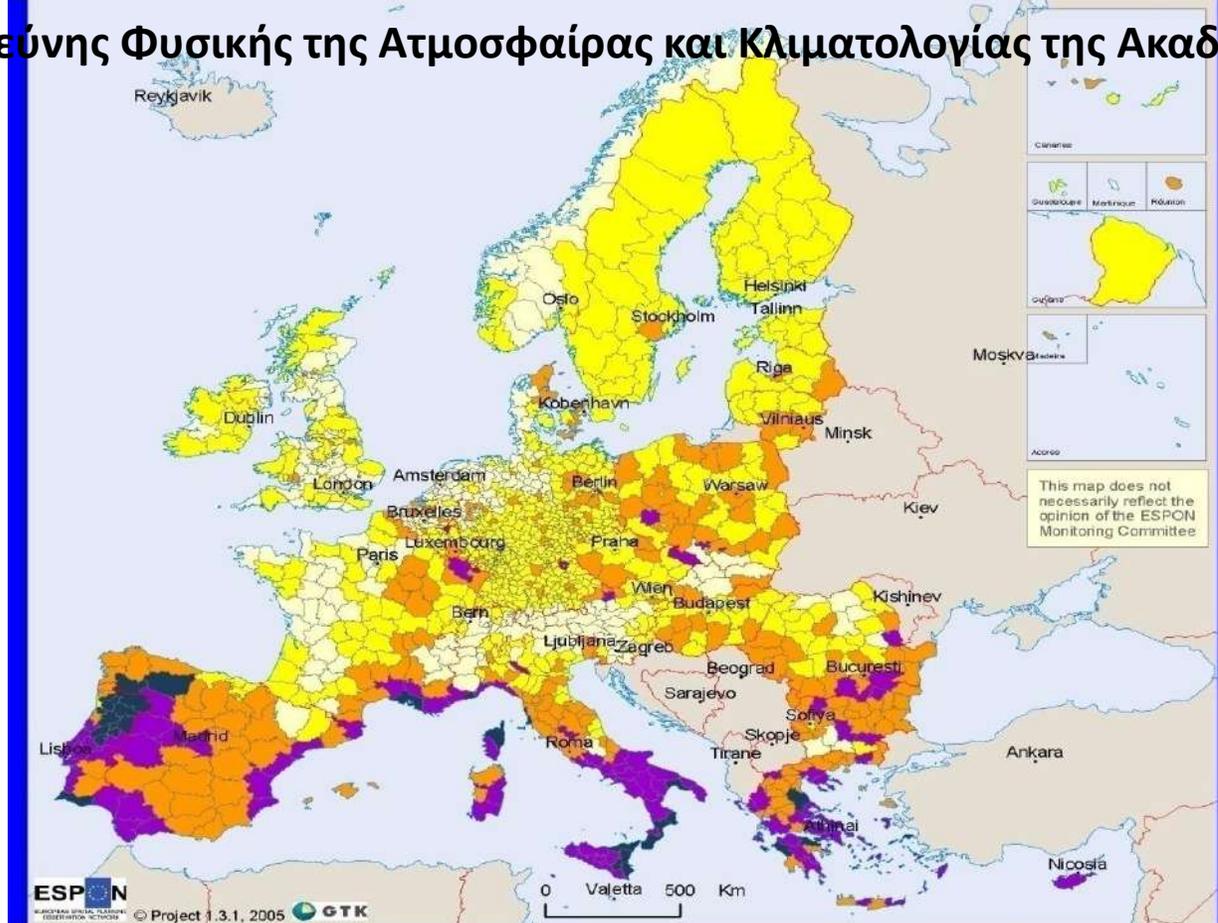
NASA-EUMETSAT  
Satellites  
(1993-present)



Tide gauges  
(1870-2000)



WMO OMM



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

## Spatial distribution of the forest fires hazards over Europe (1997-2003)

### Forest fire hazard

- Very low
- Low
- Moderate
- High
- Very high
- Non ESPON space

Origin of the data: © EuroGeographics Association for the administrative boundaries  
 Number of fires 1997-2003: ATSR World Fire Atlas European Space Agency - ESA/ESRIN  
 Biogeographic regions: EEA  
 Source: ESPON Data Base

The classification of the forest fire hazard is based on a combination of the numbers of observed fires per 1000 sq. km 1997-2003 (ATSR) and the map of biogeographic regions in Europe (EEA).

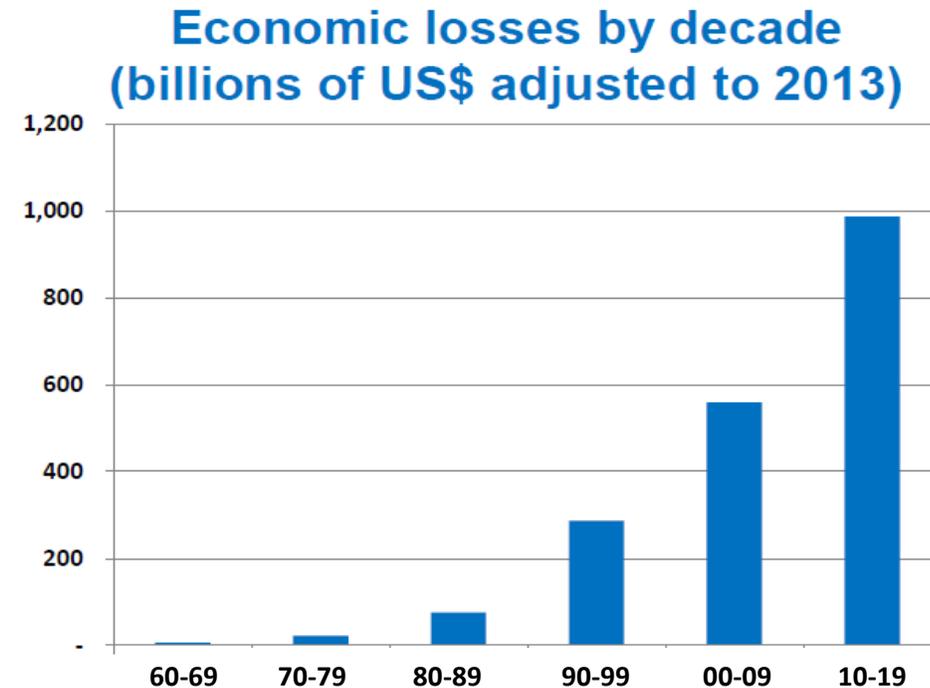
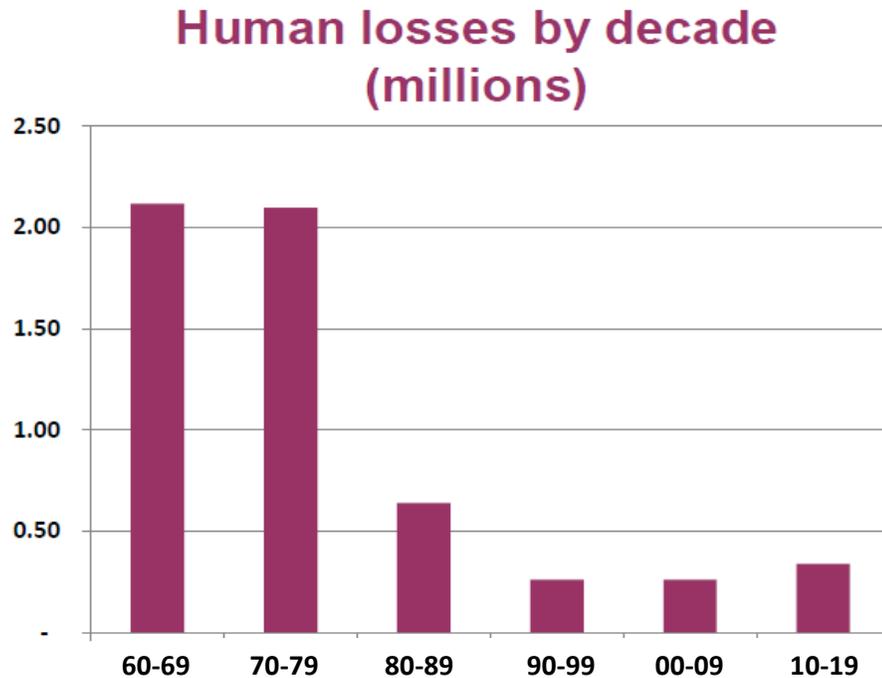
The number of observed fires per 1000 sq. km 1997-2003:

- 1 = No fires
- 2 = <1 fires
- 3 = 1-5 fires
- 4 = 5-10 fires
- 5 = >10 fires

Biogeographic regions:

- 1 = Alpine and Arctic
- 2 = Atlantic
- 3 = Boreal
- 4 = Continental, Black sea, Pannonian and Steppic
- 5 = Mediterranean

## Impacts of hydrometeorological and climatological hazards (1955–2014)

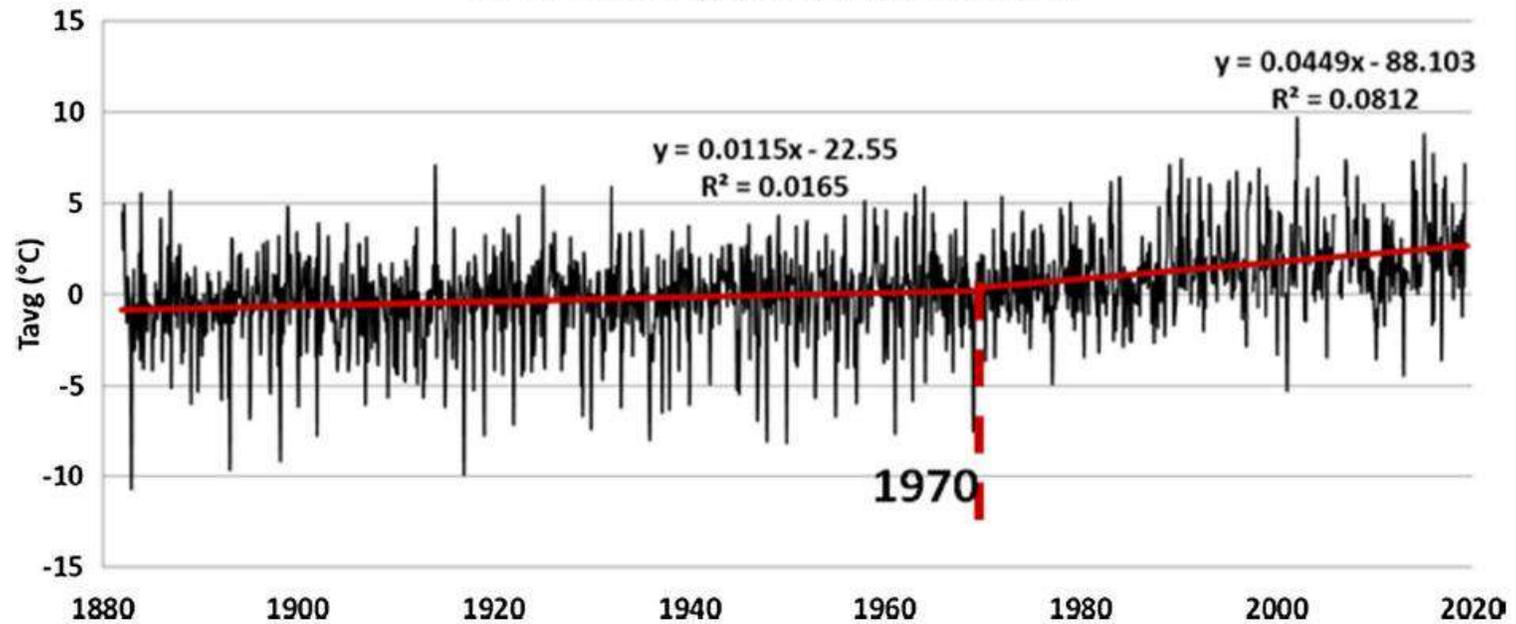


**Reduction of the number of victims thanks to greater effectiveness of early warning systems and prevention measures**

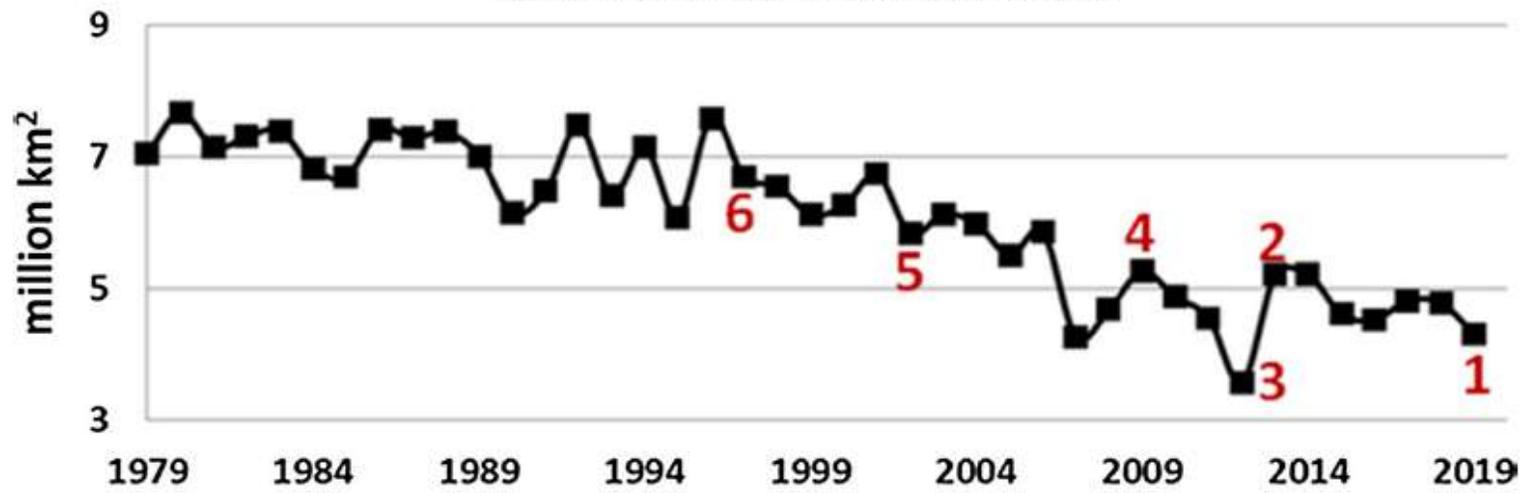
**Table 3** Historical Pandemics in the northern hemisphere from 1889 to 2019

Pandemic	Onset date	Origin of Outbreak	Type and proposed carrier in the literature (see references)
1. COVID-19	17 November 2019	Wuhan China	Coronavirus, bats, pangolins
2. Bird Flu	19 February 2013	Shanghai China	H7N9, birds, poultry
3. MERS	November 2012	Jeddah Saudi Arabia	Coronavirus, bats, camels
4. Swine Flu	17 April 2009	San Diego, California, USA	H1N1, pigs
5. SARS-CoV	November 2002	Guangdong China	Coronavirus, bats, Civets
6. Bird flu	March 1997	Hong Kong	H5N1, birds, poultry
7. Hong Kong Flu	July 1968	Hong Kong	H3N2, birds, pigs
8. Asian Flu	February 1957	Guizhou China	H2N2, birds
9. Spanish Flu	1918	Possibly China	H1N1, birds, poultry
10. Russian Flu	1889	Asia, Canada and Greenland	H2N2, birds

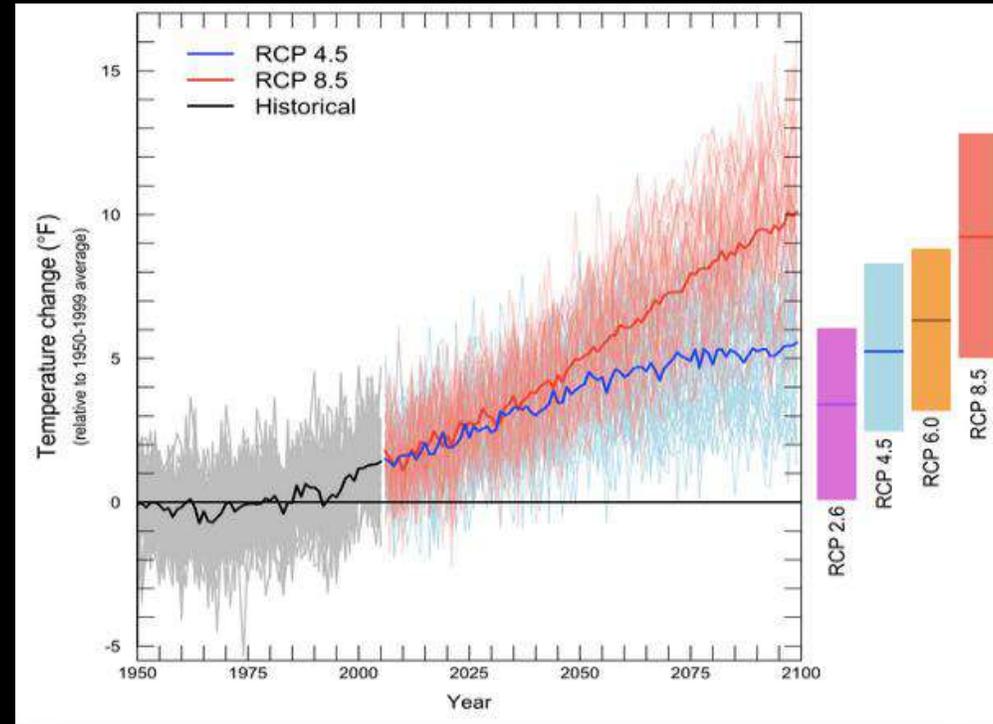
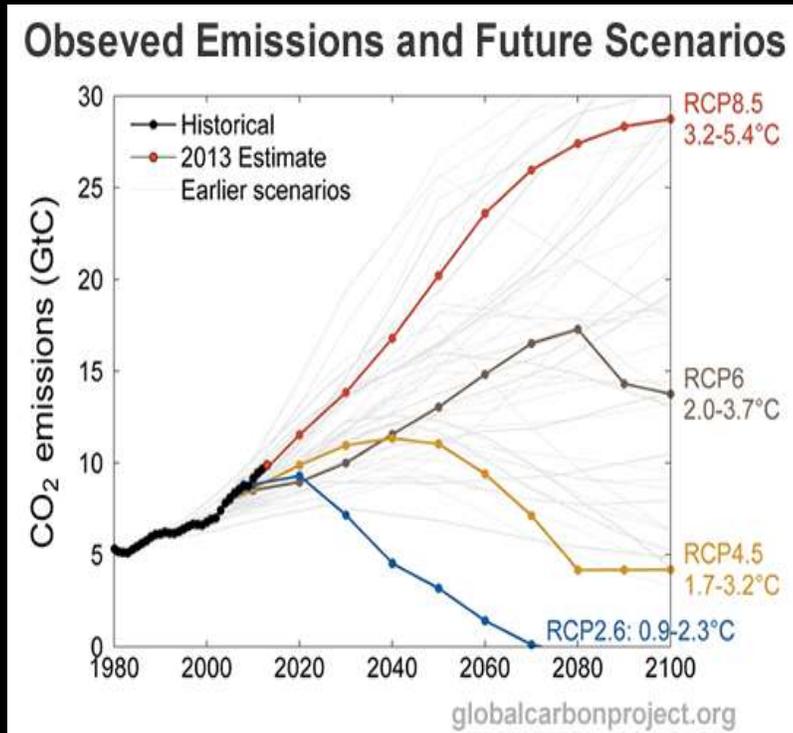
Mean temperature anomaly at Irkutsk



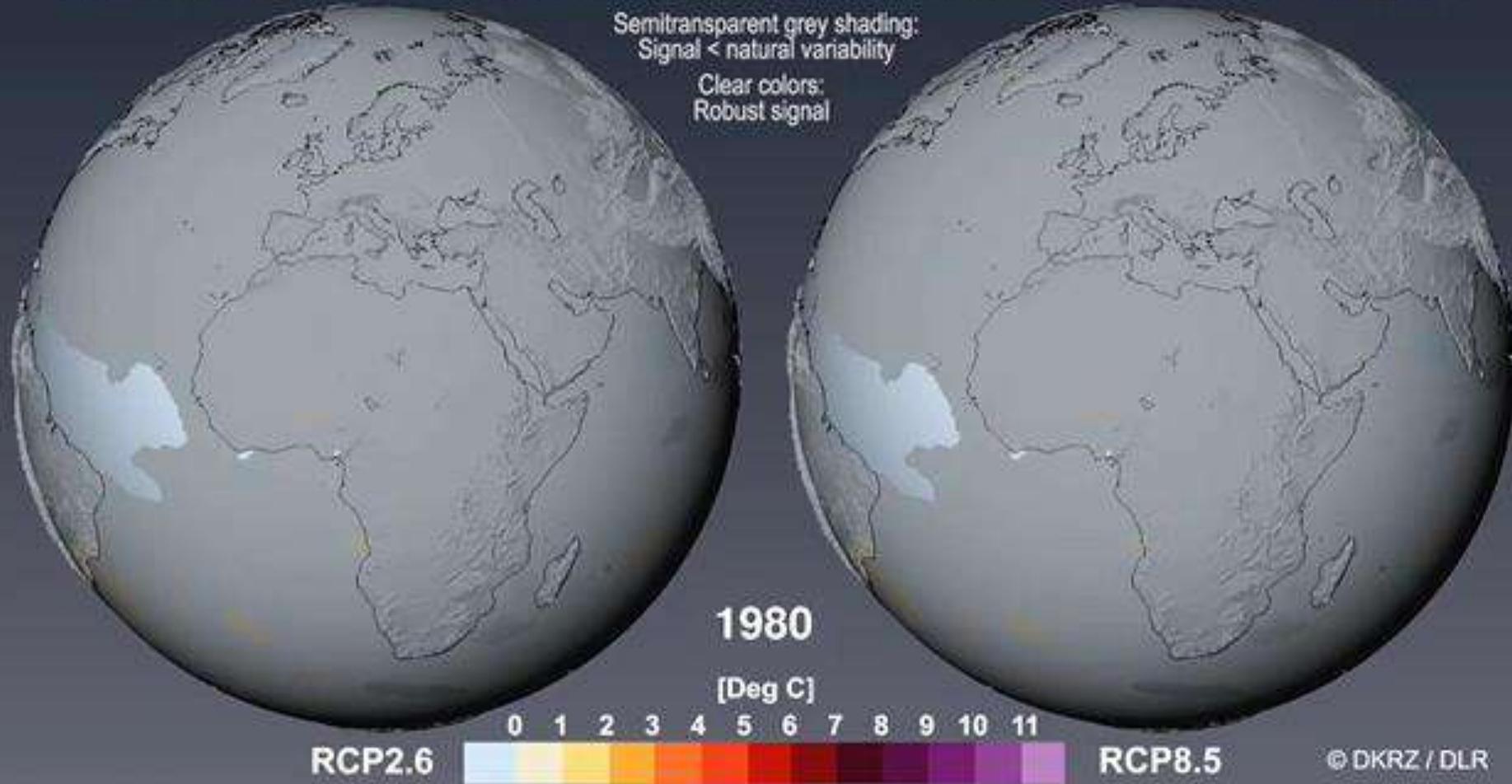
Minimum Sea Ice Area : Arctic



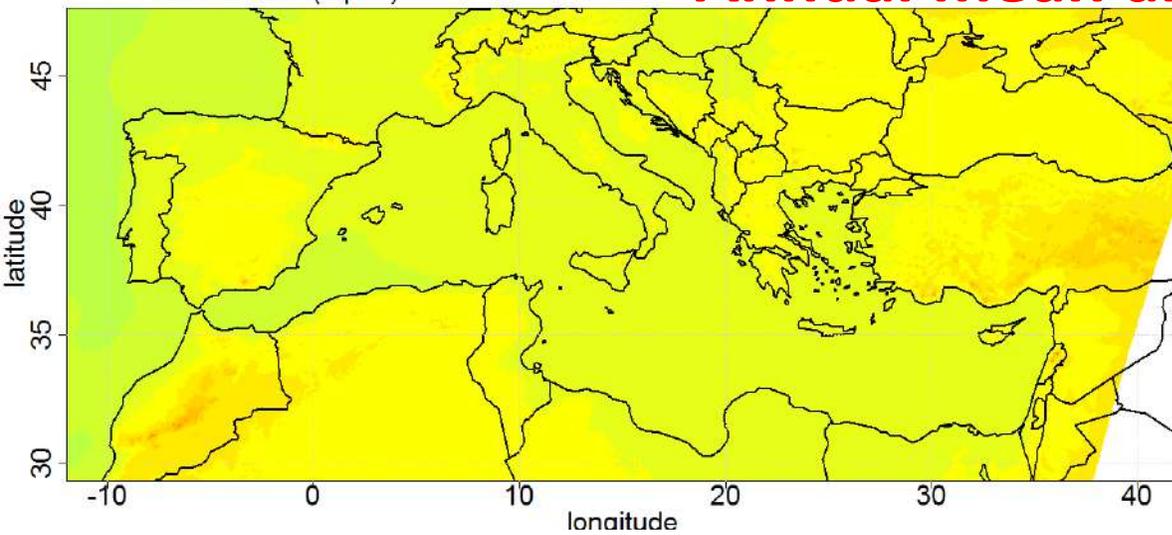
## Climate warming from two CO<sub>2</sub> emission scenarios



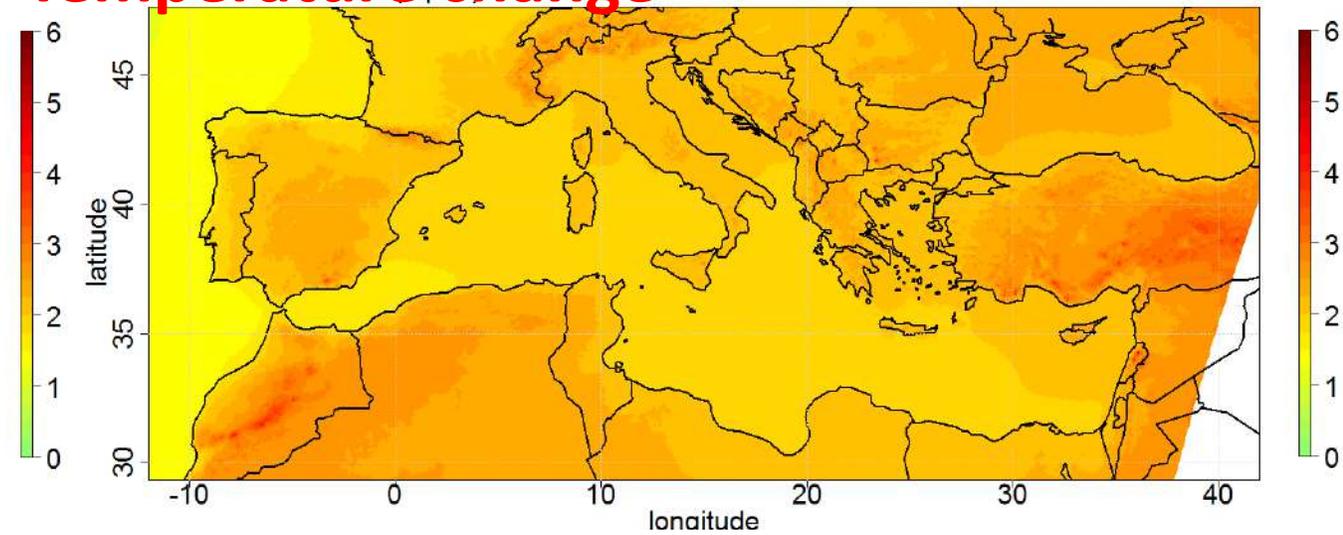
### CMIP5 Multi Model Ensemble: 2m Temperature Anomaly relative to 1986-2005



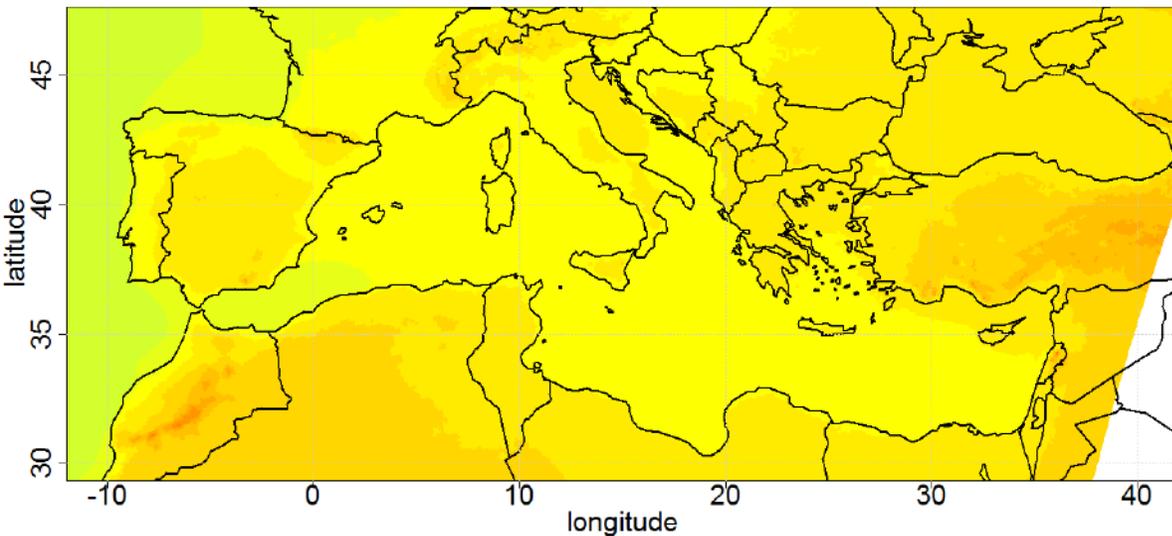
# Annual mean air Temperature change



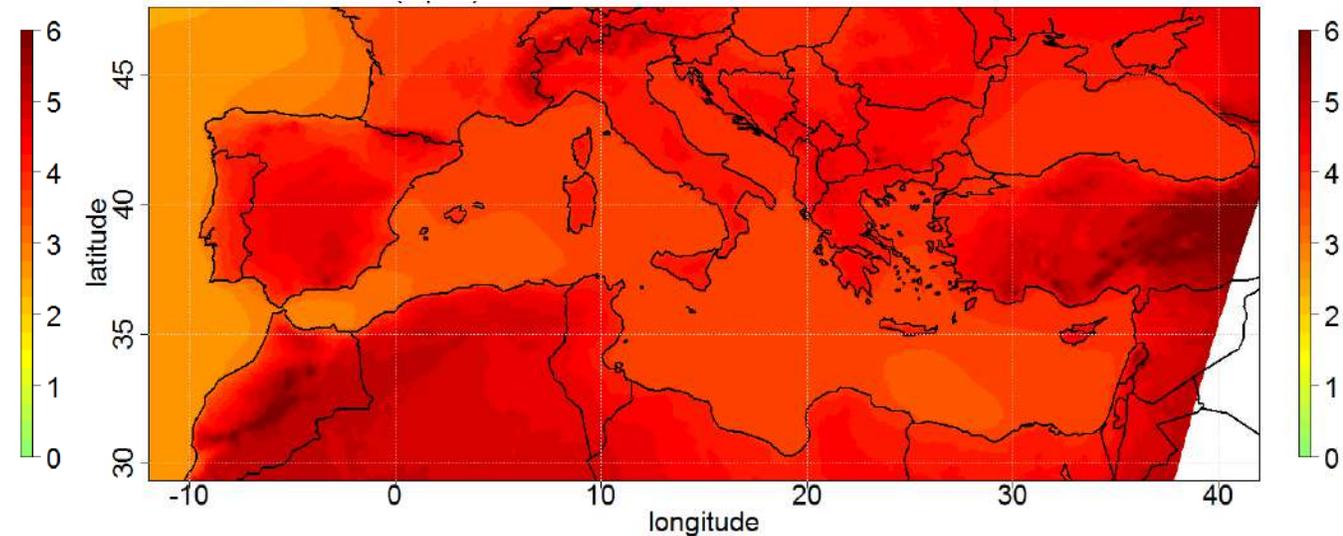
RCP45: Change Between 2021-2050 and 1961-1990



RCP85: Change Between 2021-2050 and 1961-1990

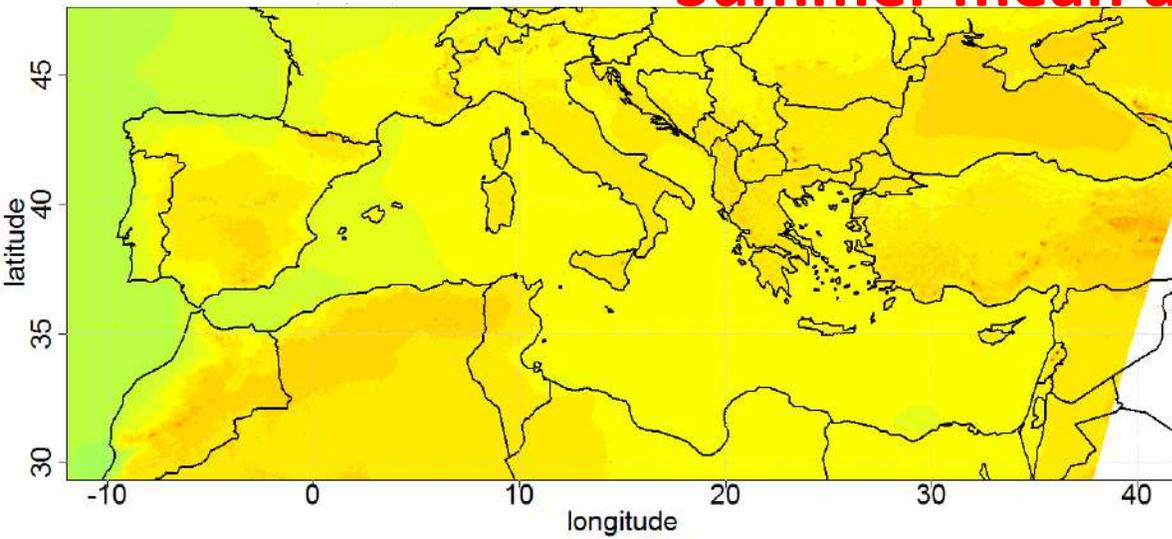


RCP45: Change Between 2071-2100 and 1961-1990

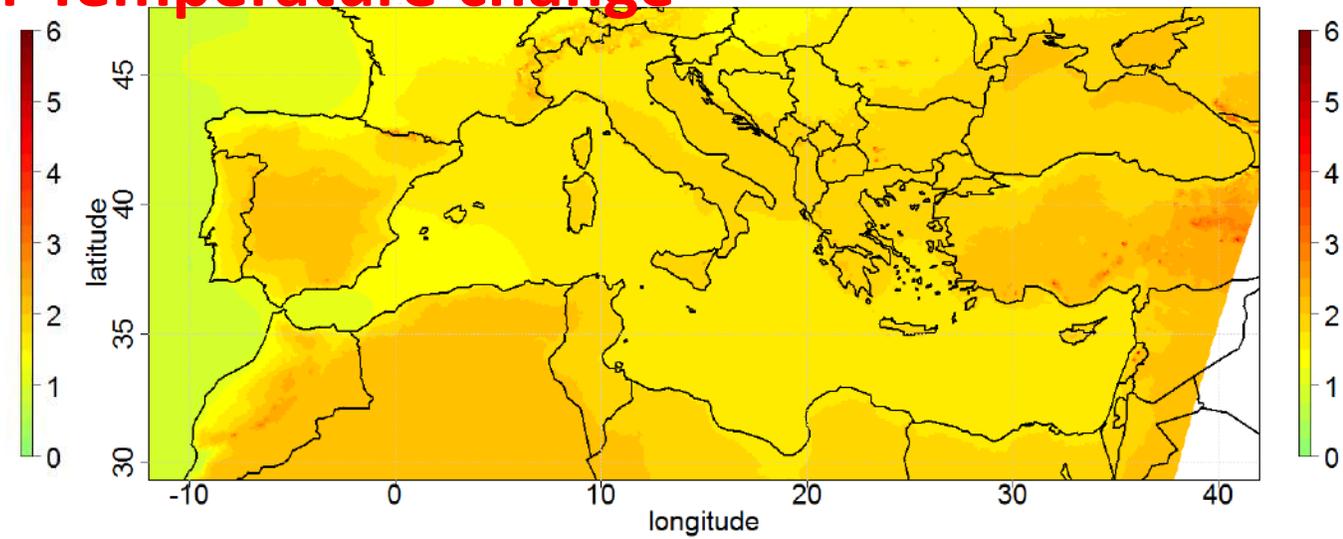


RCP85: Change Between 2071-2100 and 1961-1990

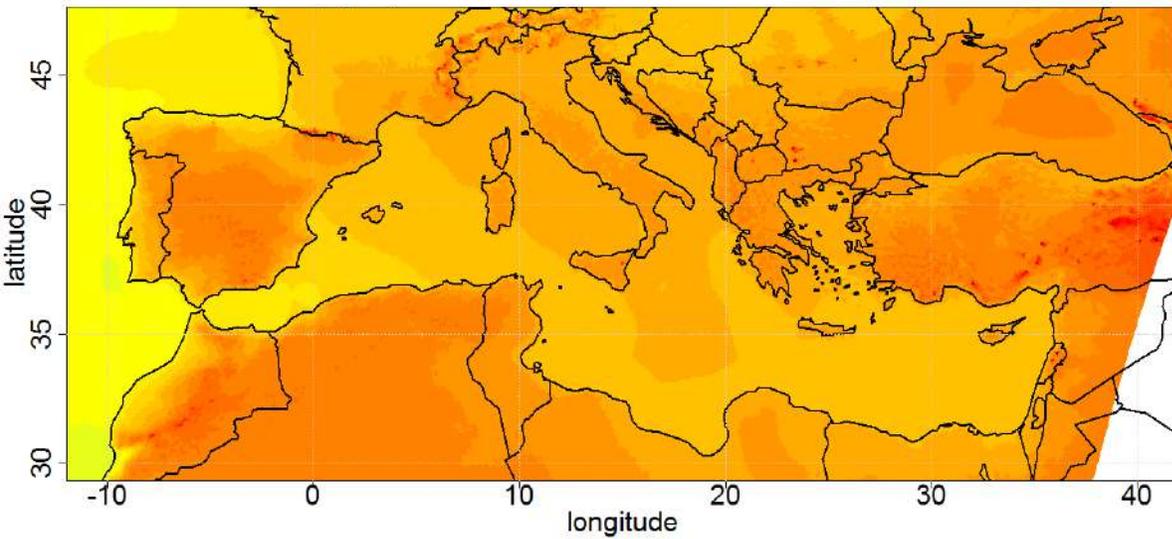
# Summer mean air Temperature change



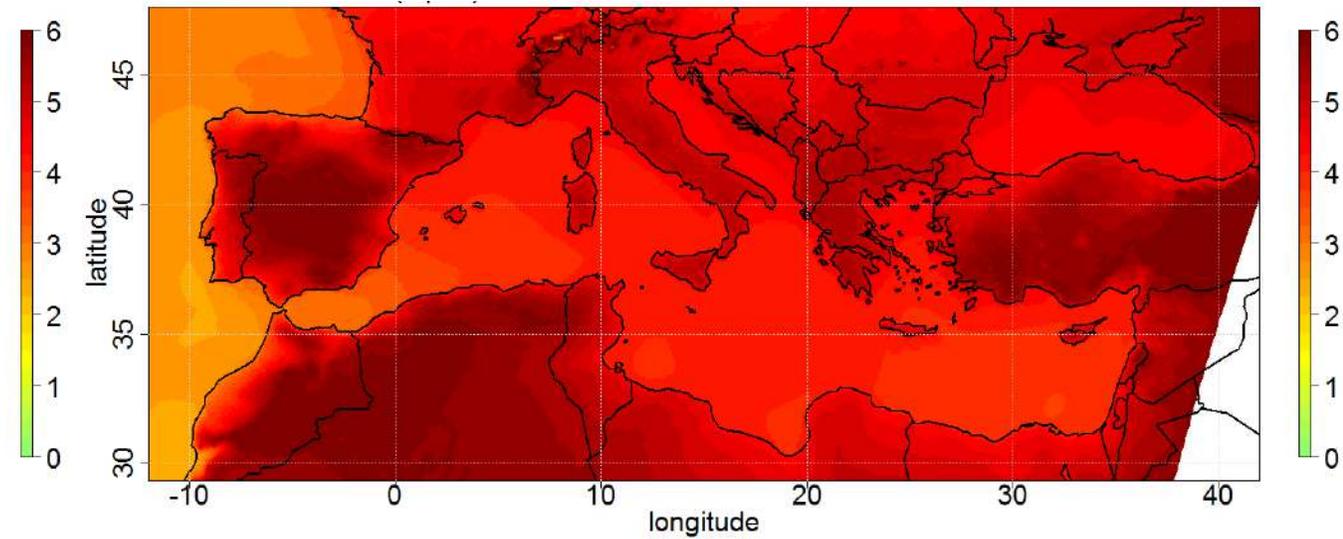
RCP45: Change Between 2021-2050 and 1961-1990



RCP85: Change Between 2021-2050 and 1961-1990

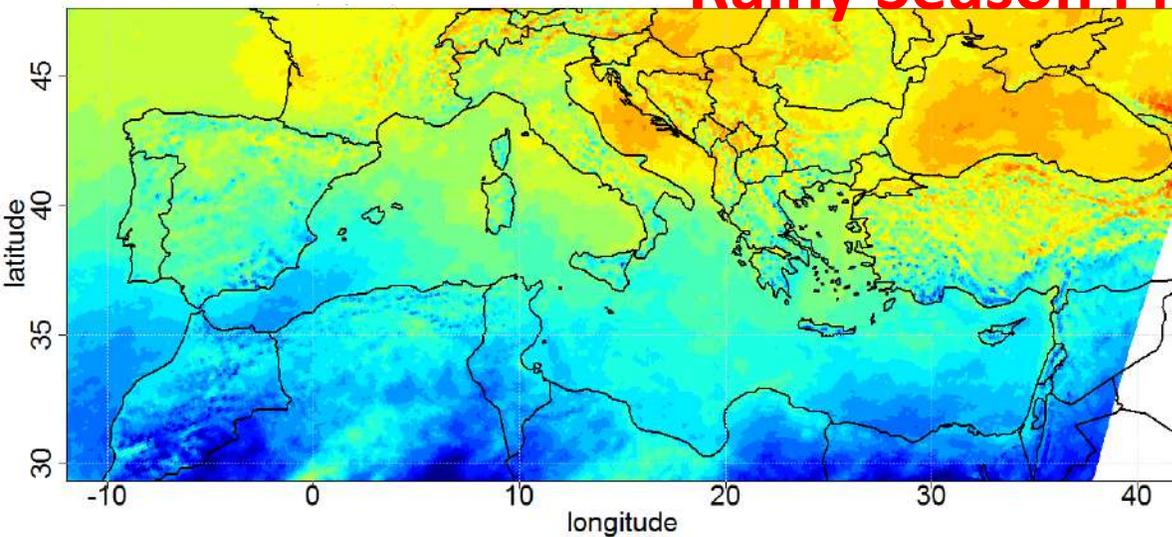


RCP45: Change Between 2071-2100 and 1961-1990

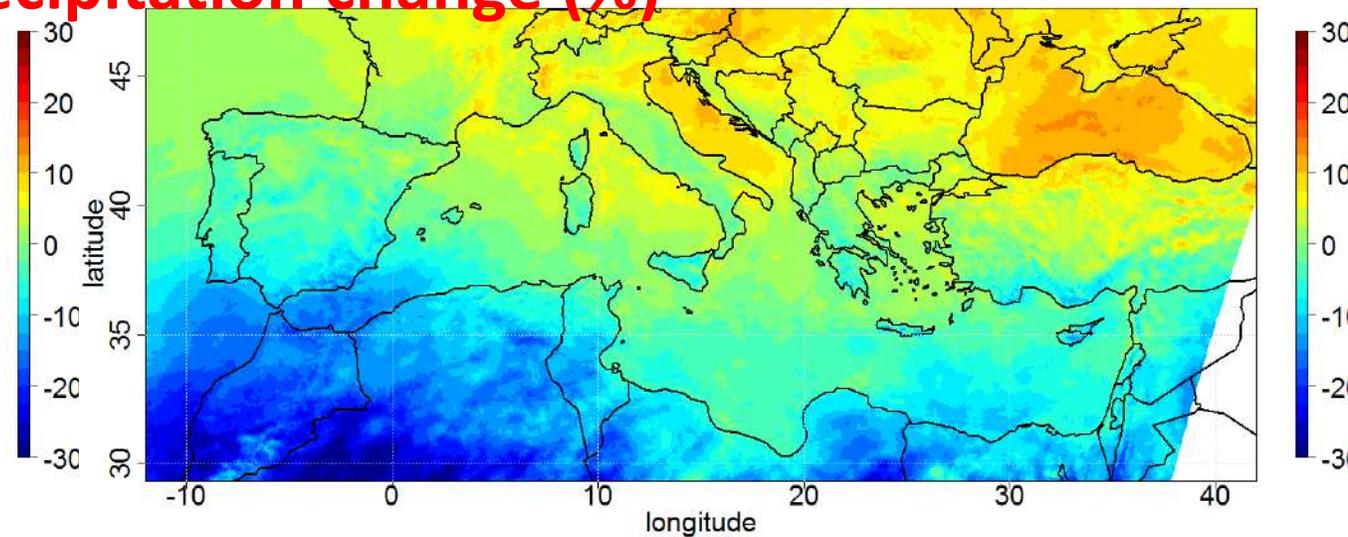


RCP85: Change Between 2071-2100 and 1961-1990

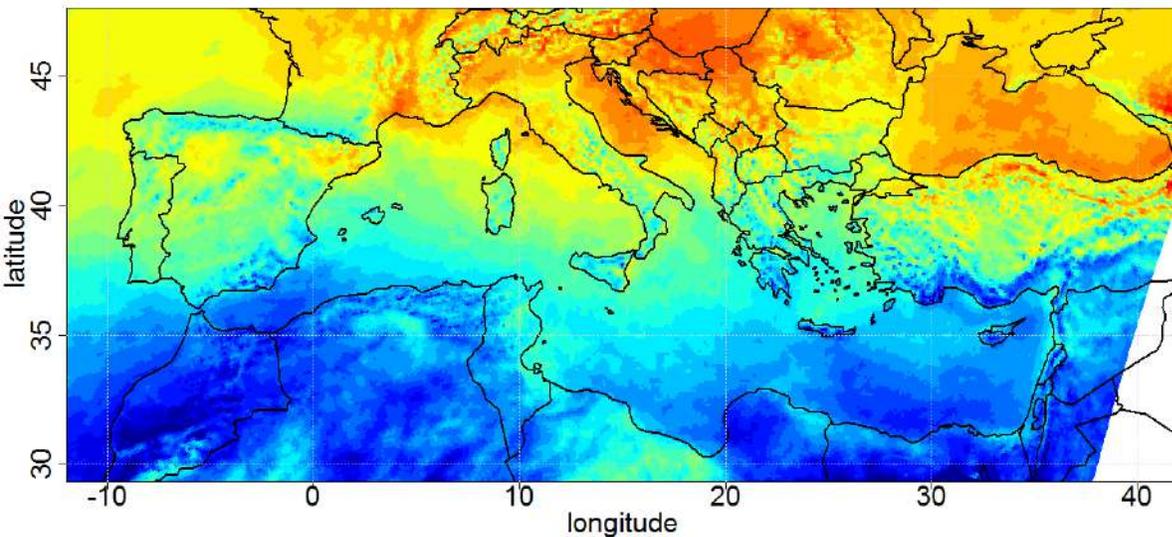
# Rainy Season Precipitation change (%)



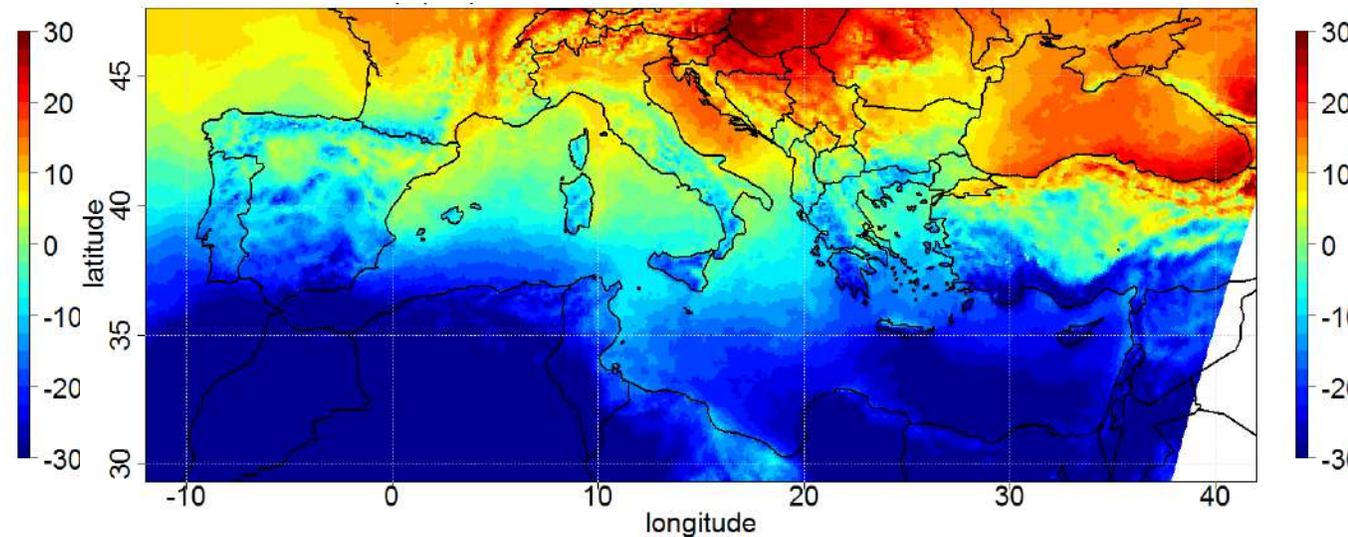
RCP45: Change Between 2021-2050 and 1961-1990



RCP85: Change Between 2021-2050 and 1961-1990

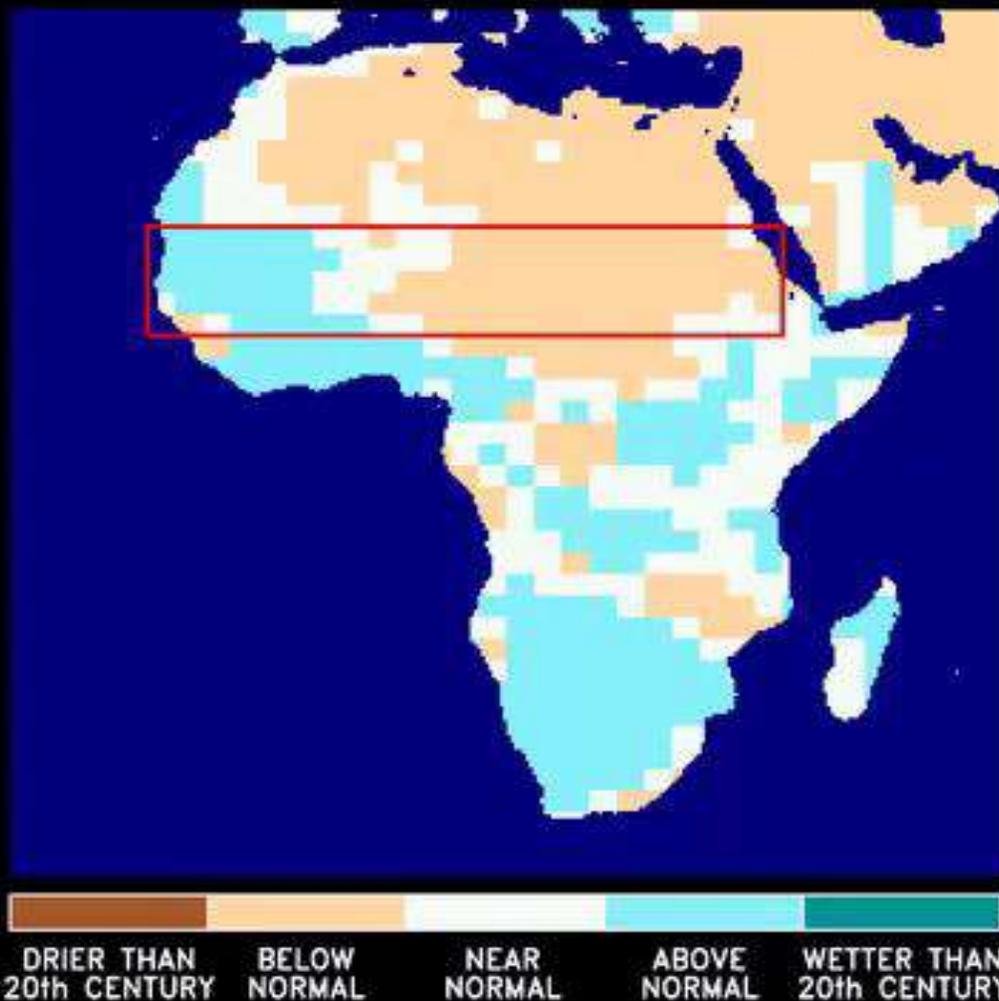


RCP45: Change Between 2071-2100 and 1961-1990

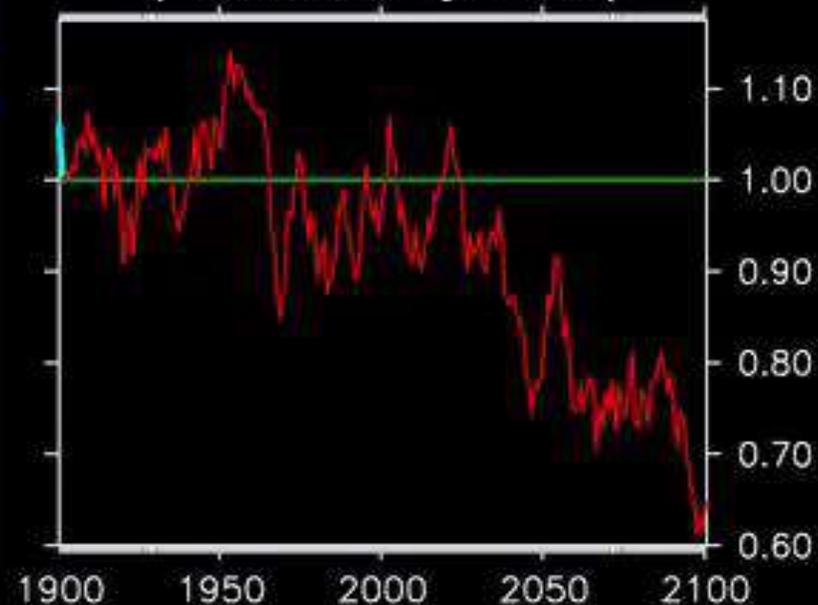


RCP85: Change Between 2071-2100 and 1961-1990

### 5 YEAR AVG PRECIPITATION CATEGORIES



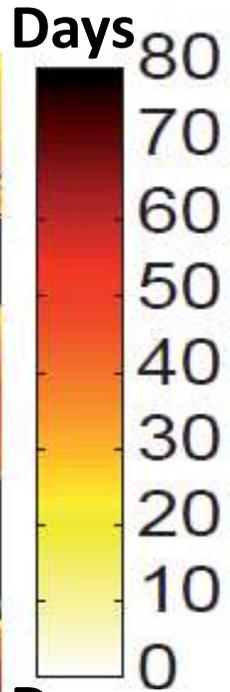
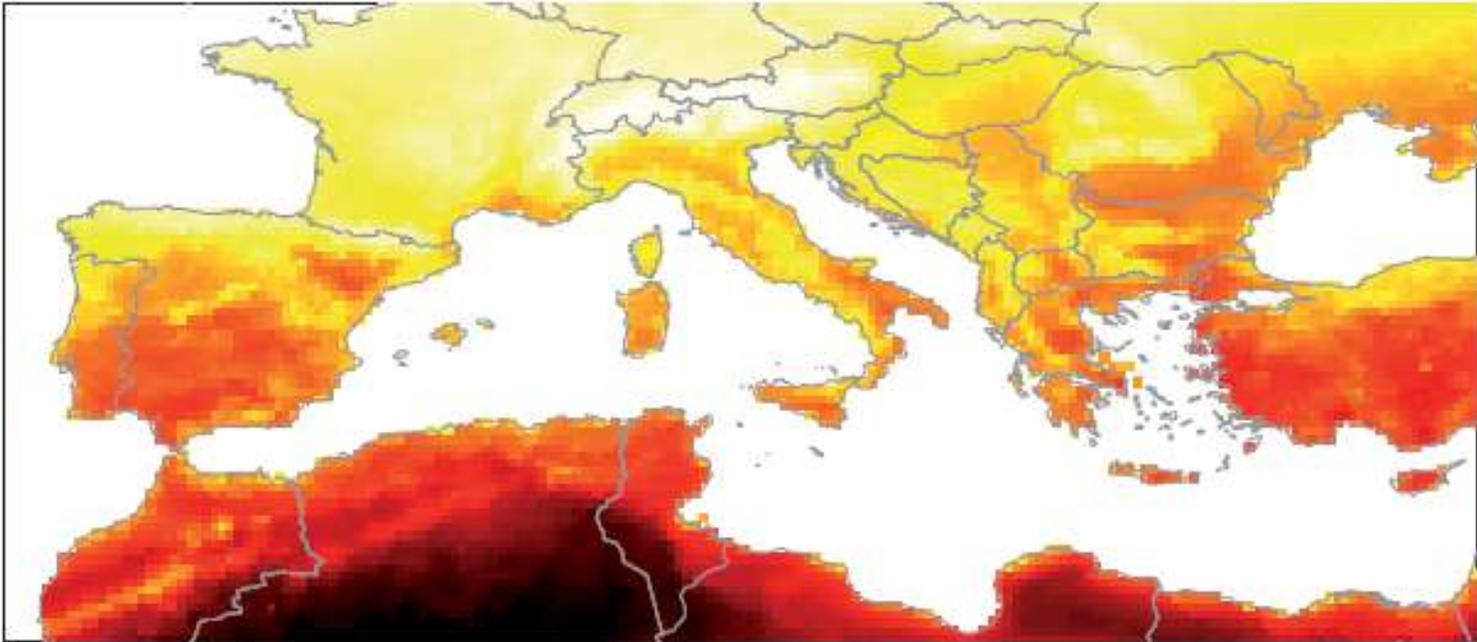
### SAHEL ANNUAL RAINFALL vs. TIME (1901-2000 avg. = 1.00)



1901

NOAA GFDL CM2.0 MODEL  
20C3M + SRES A1B Scenario

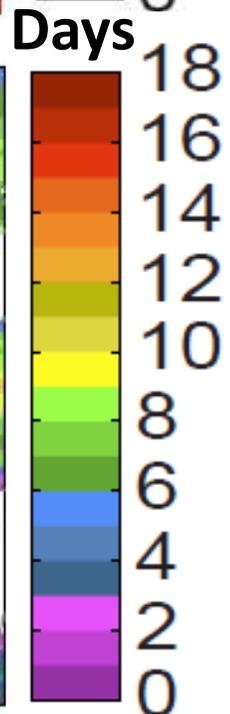
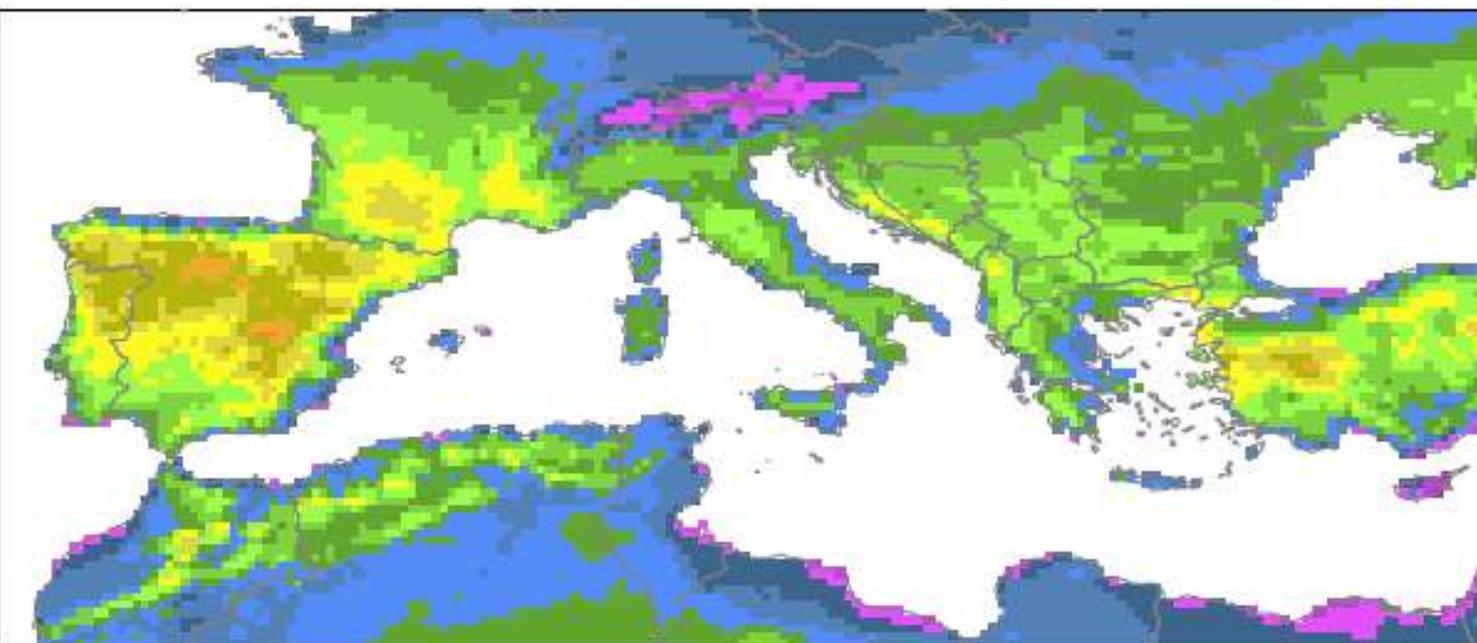
FWI



Number of Days  
with High Fire weather risk

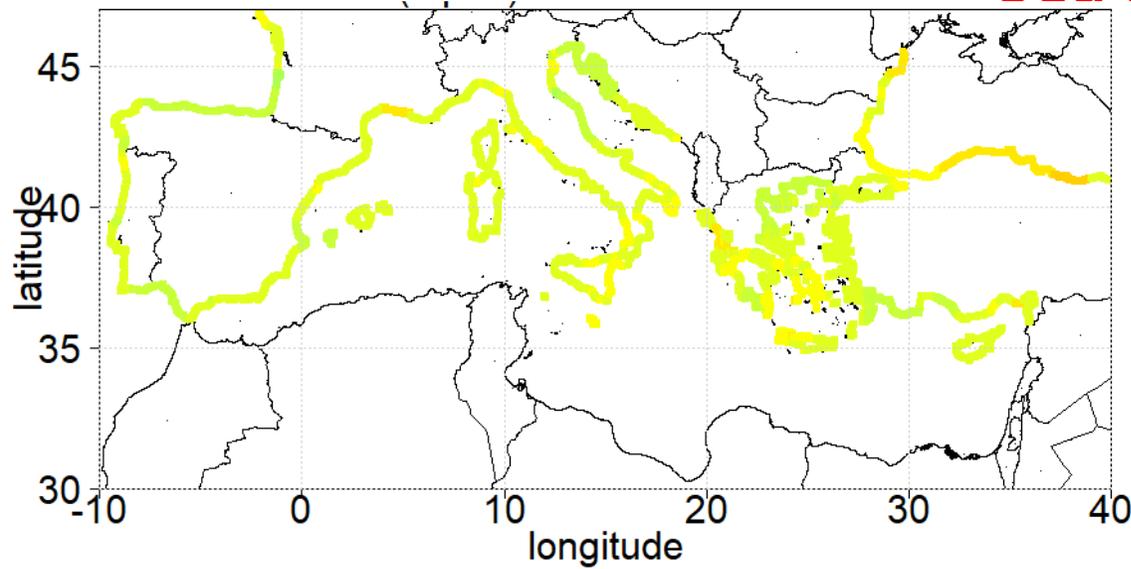
**Control  
1971-2000**

FWI

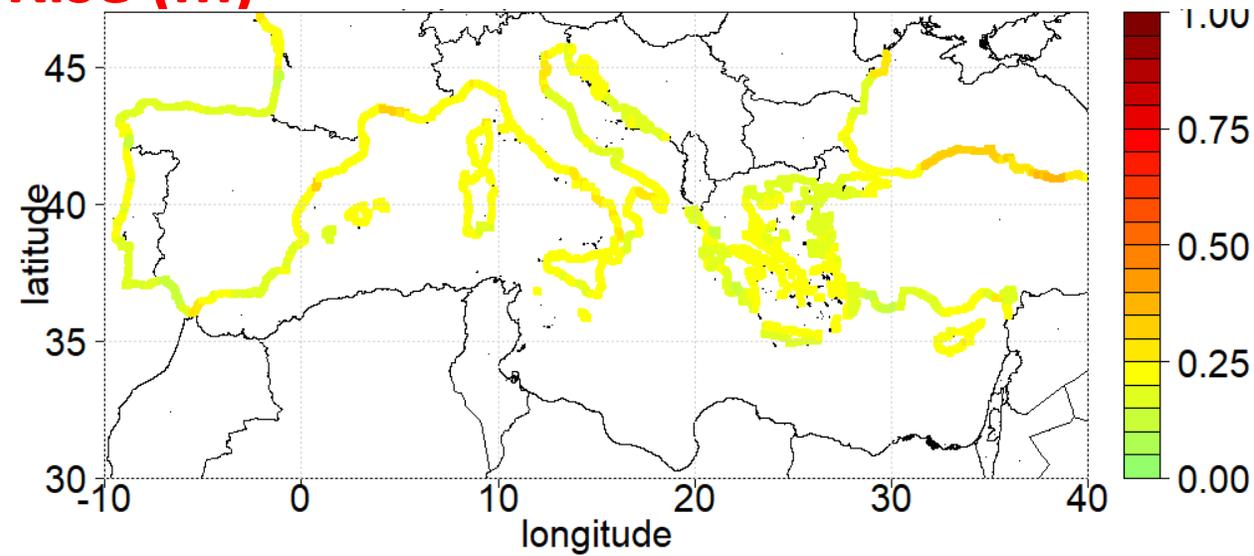


**Change between  
2071-2100 and 1971-2000**

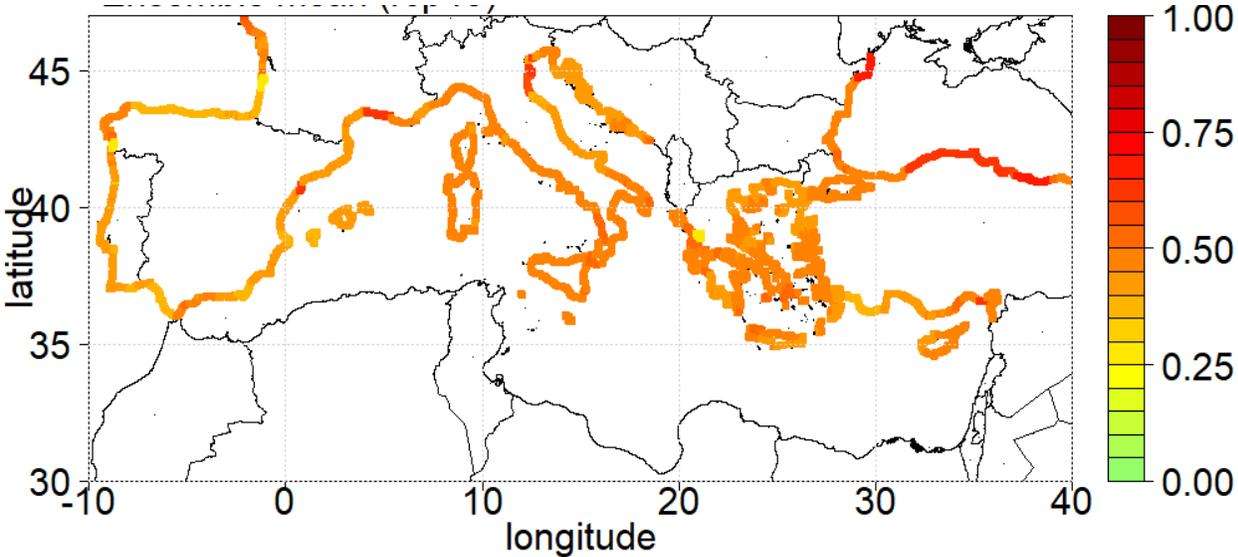
# Sea Level Rise (m)



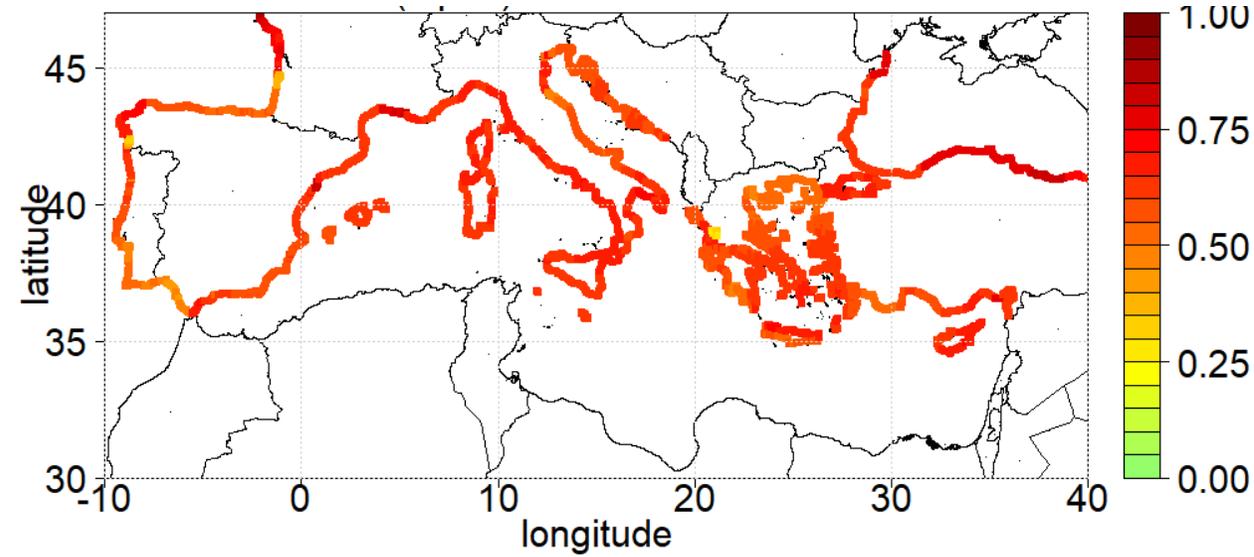
RCP45: Change Between 2021-2050 and 1961-1990



RCP85: Change Between 2021-2050 and 1961-1990



RCP45: Change Between 2071-2100 and 1961-1990



RCP85: Change Between 2071-2100 and 1961-1990

## In conclusion: Climate Change can be summarized as follows

- Mediterranean mean Air temperature rose more than 1.5 ° C over last 100 years. Is expected to increase 3,0° C (RCP 4,5) / 5,0° C (RCP 8.5) till 2100. The increase is higher during summer months.
- To already observed Rainy Season Precipitation over the Mediterranean of 10% within last 100 years, is expected to continue even more 15% (RCP 4,5) / 30% (RCP 8.5) till 2100.
- Sea level rose by about 25 cm since 1880 (IPCC, 2017). is projected to be between 0.3 m and 0.6 m (RCP 4.5) / 0.4 m and 0.8 m (RCP 8.5) by 2100.
- Extreme weather events (such as heat waves, floods, droughts, forest fires) are expected to intensify over the coming decades.