

# CLIMATE CHANGE AND ITS EFFECTS ON GREECE

Erasmus+ eHAND project

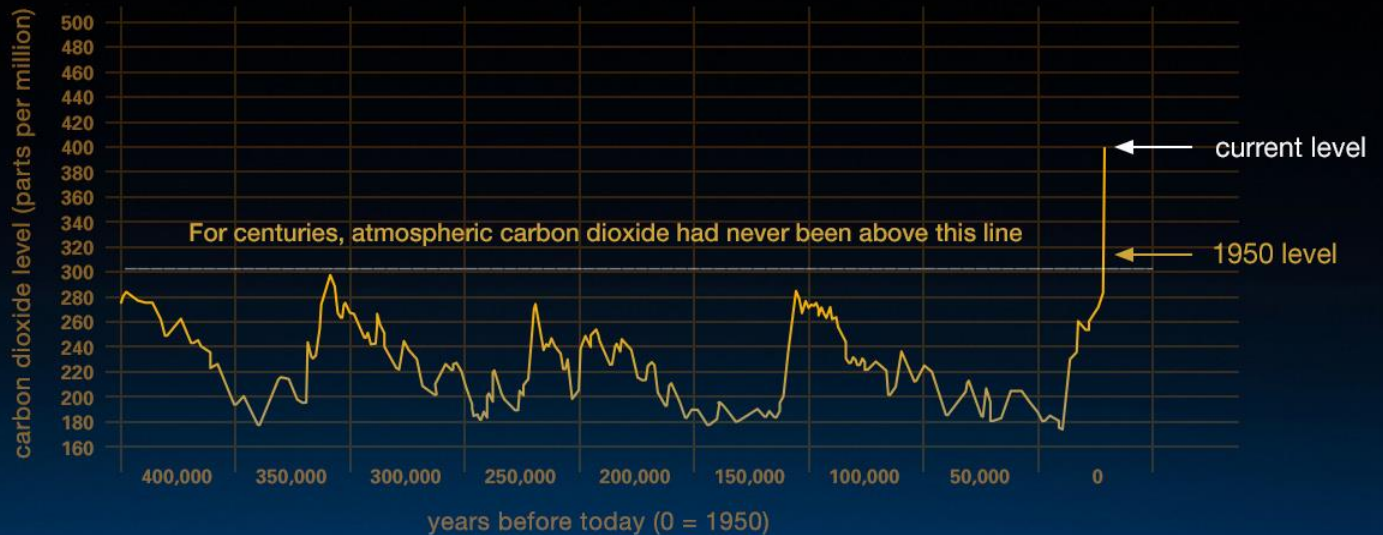
“Effects of Human Activities on Natural Disasters”

2<sup>nd</sup> General Lyceum of Oreokastro



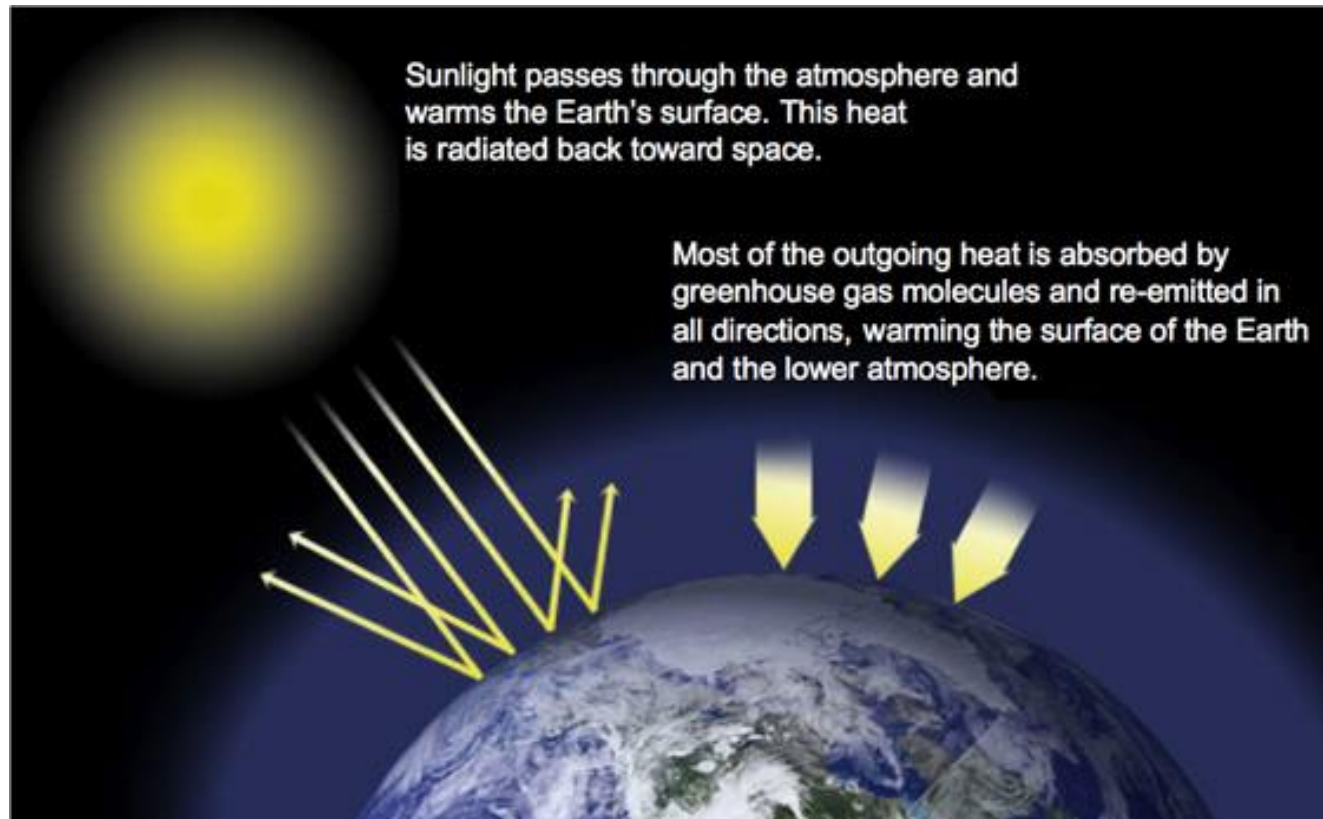
# Climate change: How do we know?

The Earth's climate has been changing over the centuries, but it has never reached such extreme numbers.



# A blanket around the Earth

- The “Greenhouse Effect” is responsible for maintaining the Earth’s surface’s temperature stable (15° C).
- The higher the release of CO<sub>2</sub> in the atmosphere, the higher the levels of the temperature.





## **CLIMATE CHANGE ON A GLOBAL SCALE**

○ **NOT SIMPLY AN ENVIRONMENTAL PROBLEM (BECAUSE OF GLOBAL WARMING OR EXTREME WEATHER CONDITIONS)**

**BUT**

**INTRICATELY CONNECTED TO THE DEVELOPMENT MODEL OF A COUNTRY WHICH IT AFFECTS DIRECTLY AND DECISIVELY, ALTHOUGH NOT ALWAYS WITH THE SAME INTENSITY.**



**GREECE HAS BEEN A KEEN SUPPORTER OF INTERNATIONAL AND EUROPEAN DECISIONS ON CLIMATE PROTECTION, SINCE, AS A COUNTRY PARTLY TO BLAME FOR CLIMATE CHANGE BUT ALSO GREATLY AFFECTED BY IT, IT CAN ONLY BENEFIT FROM THE IMPLEMENTATION OF THESE AGREEMENTS AND MEASURES ON AN INTERNATIONAL LEVEL**

# General effects of climate change

Effects that scientists had predicted in the past are now occurring:

- Icebergs and glaciers are melting
- Sea levels are rising
- Longer, more intense heat waves and global warming
- Droughts
- Stronger hurricanes
- Extreme weather conditions



# Effects of Global Warming on the Mediterranean Sea

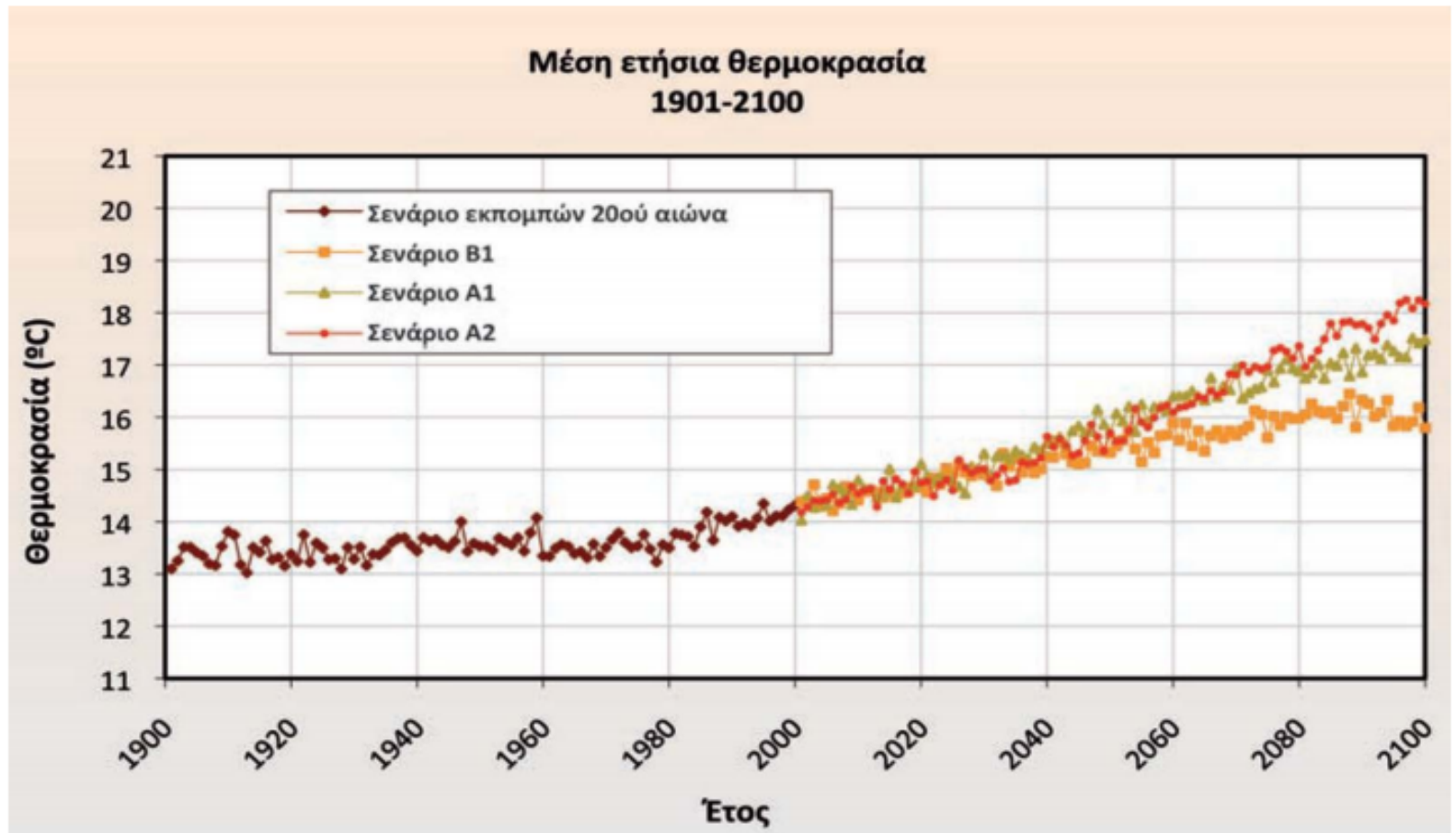
(according to IPCC 2007, 2013)

1. An increase of more than 2°C will lead to an increase of barren grassland in the Mediterranean ecosystem at the expense of bushland.
2. Dry lands will suffer extensively due to the reduction of water resources.
3. Warmer and drier conditions will be responsible for the reduced productivity of forest areas and the increase in forest fires. Agriculture and forestry have already suffered greatly due to the increased occurrence of heat waves, droughts and floods.
4. An increase of 20-34% in the weeks per year with a higher risk of fires.
5. Coastal wetlands are vulnerable to climatic change and medium and long-term change of the sea level.



# The Average Annual Temperature in Greece during the period 1901-2100

**Διάγραμμα 9:** Χρονική Εξέλιξη της Μέσης Ετήσιας Θερμοκρασίας Κατά τη Χρονική Περίοδο 1901-2100 για την Ελληνική Επικράτεια με Βάση τα Σενάρια Εκπομπών του 20ού Αιώνα και τα Σενάρια B1, A1 και A2





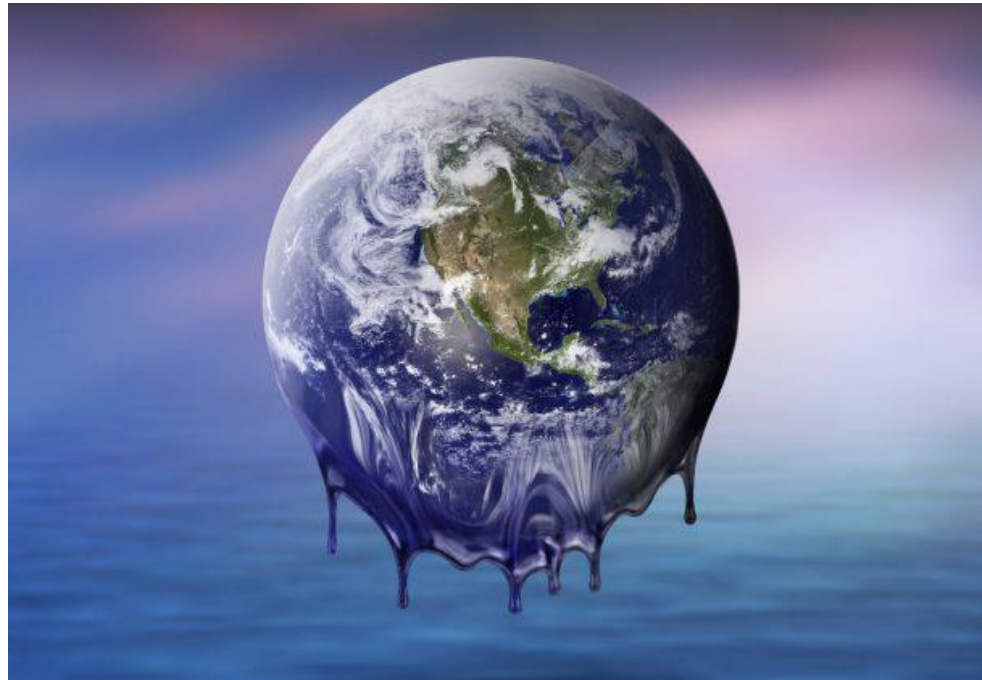
# The effects of climate change in Greece

With regard to the direct effects, due to the country's extensive coastline, many areas are at risk of flooding in the very near future, as sea levels are estimated to rise up to 2 meters.



## Expected effects are also...

- Rainfall reduction between 5% and 9%
- Temperature increase by 3-4.5 degrees Celsius
- Increased sunlight intensity



# Indirect impact

The previous effects may also affect Greece's economy on fields such as:

- Agriculture
- Tourism
- Transport



Public health, too, is going to be endangered, because this climate will favor the transmission of pests (mainly carried by insects such as mosquitoes).

## Effects on Natural Beauty in Greece

1. The warm, dry climate combined with the thousands of kilometres of coastal areas attract tourists from all over the world.
2. Warm summers, combined with mild, wet winters, favour agriculture as an integral part of the economy.
3. Thousands of hectares of forest land cover the country and host a huge biodiversity.

Today, this natural wealth is under extreme pressure due to the increase of the population and unregulated urban growth.



# Estimated Effects between 2020-2050

1. Increased discomfort of city dwellers due to heat waves (up to 20 more days per year in cities such as Thessaloniki, Patras, Lamia or Larissa), extreme rainfall (10-20% increase) and decrease of total rainfall in cities like Lamia, Larissa, Volos, Thessaloniki and Athens.
2. Increased danger of flash floods and forest fires in urban and suburban areas.
3. Tourist destinations will suffer because of the increased heat waves (5-15 days more per year) and the increase in night temperature in island areas like Rhodes and Chania (no less than 20°C).
4. The ten biggest rural prefectures of the country will suffer greatly from increased heat waves, continuous lack of rainfall, decrease in winter rainfall and subsequent risks of fire.

(WWF survey in collaboration with the National Observatory of Athens titled “Tomorrow in Greece”, an attempt at a prediction of climate conditions in Greece from 2020 – 2050)





According to a Diagnostics survey, by 2065 the climate in Greece will have changed immensely with increased temperatures of  $2.5^{\circ}\text{C}$  on average compared to the period of 1961-1990.

The increased days of heatwaves per year will reach 15-20, while rainfall will decrease by approximately 12%.

Sea levels will rise by 20-59cm, while extreme weather conditions will be more frequent. Central Macedonia, Thessaly, Western Peloponnese and Attica will suffer the most.

Greece has not designed a national strategy of tackling climate change yet, even though geographically it is located in one of the mostly affected areas of the Mediterranean. Adaptation is a necessity, not a luxury, Our country's dependence on the natural environment is too important to overlook, even in times of economic crisis.

Agricultural production will suffer immensely.  
Tourism will be seriously affected.  
Coastal areas will change, as well as Greeks' everyday life.

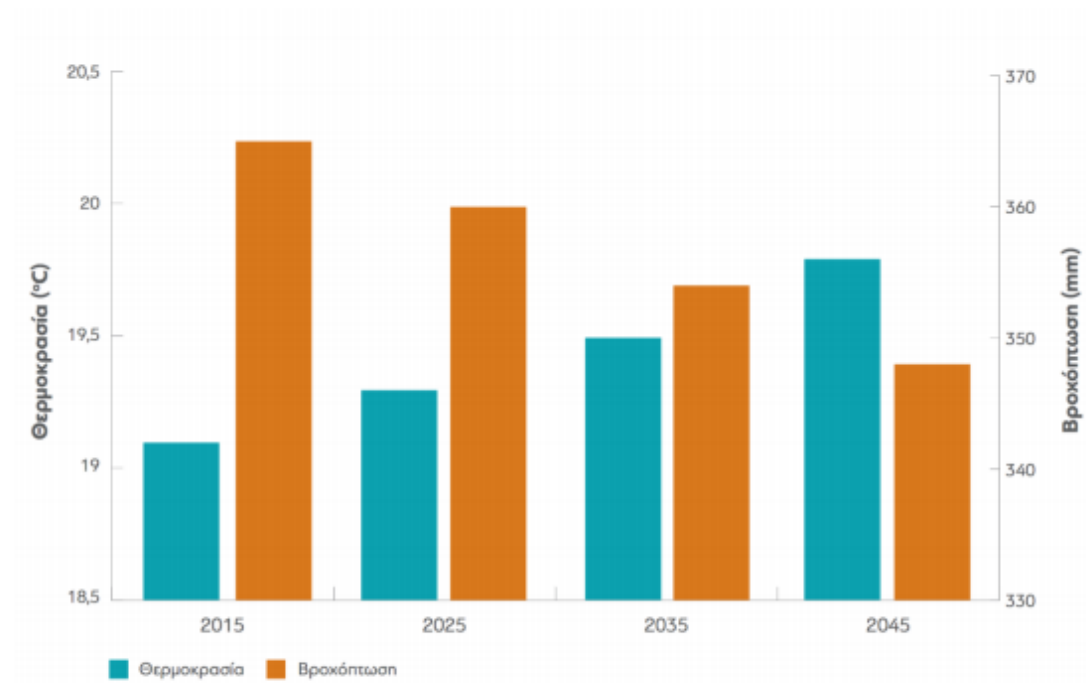
e.g. Ornos, Mykonos island

*Παράδειγμα Μύκονος – Ορνός*



# Temperature and rainfall fluctuations in Athens from 2015-2045

Στο διάγραμμα που ακολουθεί παρουσιάζεται η μεταβολή των κλιματικών παραμέτρων της θερμοκρασίας και της βροχόπτωσης για το διάστημα 2015-2045 στην Αθήνα.





# A small benefit for Greece

The slight rise in temperature and the increased sunlight intensity can have a positive effect on the production of solar and wind power.

Hence, should Greece take advantage of that, it may benefit.





Thank you for your attention

**GRIGORIS CHATZIANDREOU**