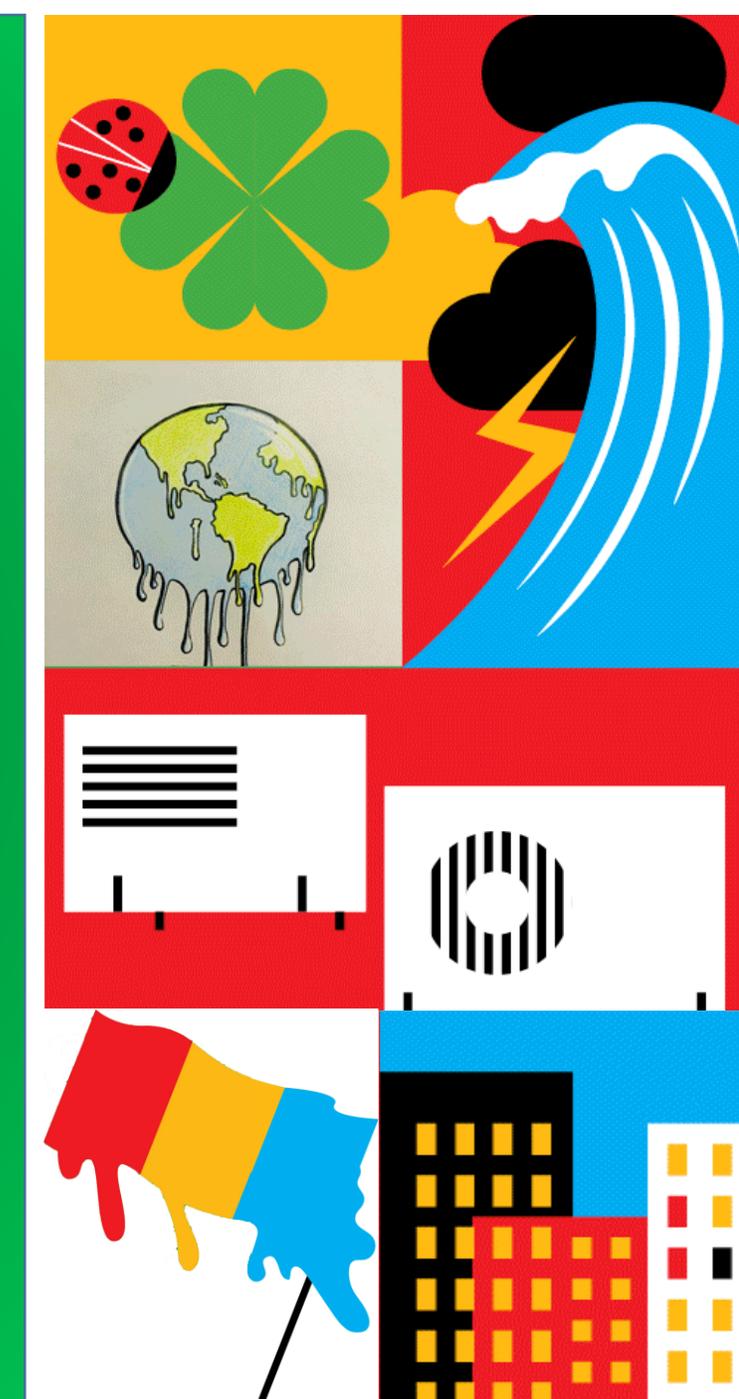


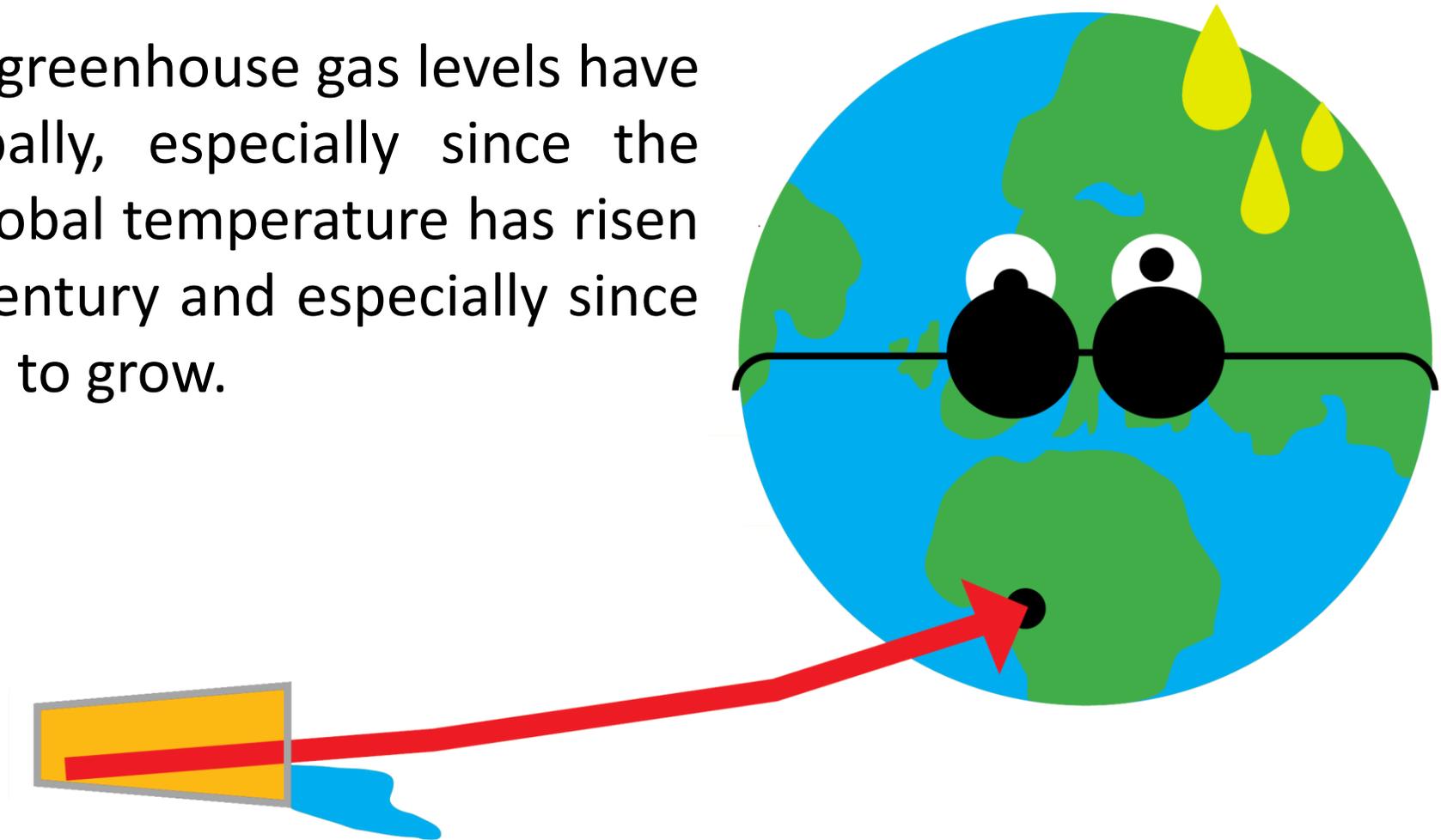
Climate Policy

ROMANIA



GLOBAL CONTEXT

Over the last 200 years, greenhouse gas levels have steadily increased globally, especially since the Industrial Revolution. Global temperature has risen steadily since the 20th century and especially since the 1970s and continues to grow.



>50%

of the CO₂ emitted by people since 1750 has come into the atmosphere in the last 40 years

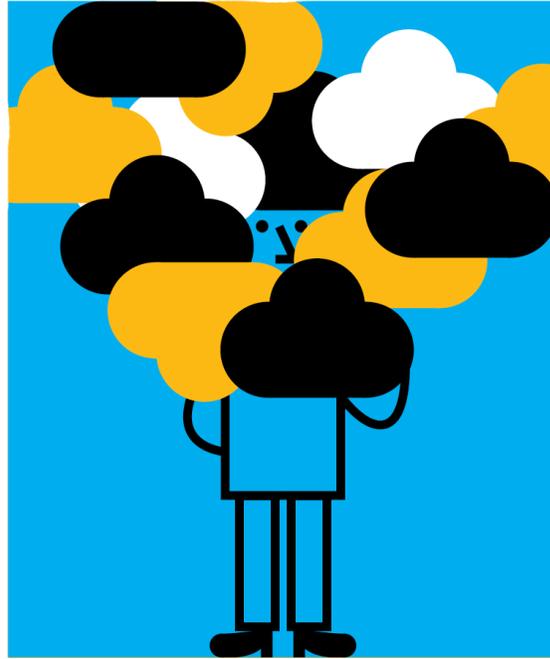


2 ° C - 5 ° C

are the expected growth limits for global average temperature in different scenarios, up to 2100, compared to pre-industrial levels.

95%

of the greenhouse effect observed today is generated by people's activity

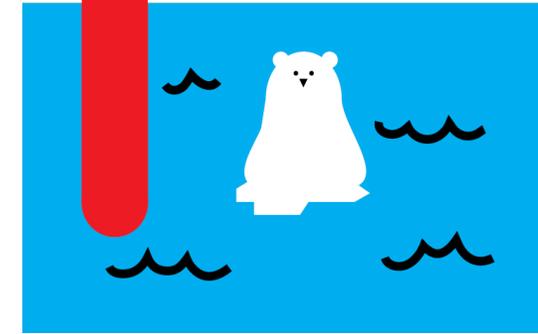


2 ° C

is the maximum threshold set by the **Paris Agreement** in December 2015 the average global temperature increase over the pre-industrial period. After this level, the effects of climate change would become severe and unpredictable.

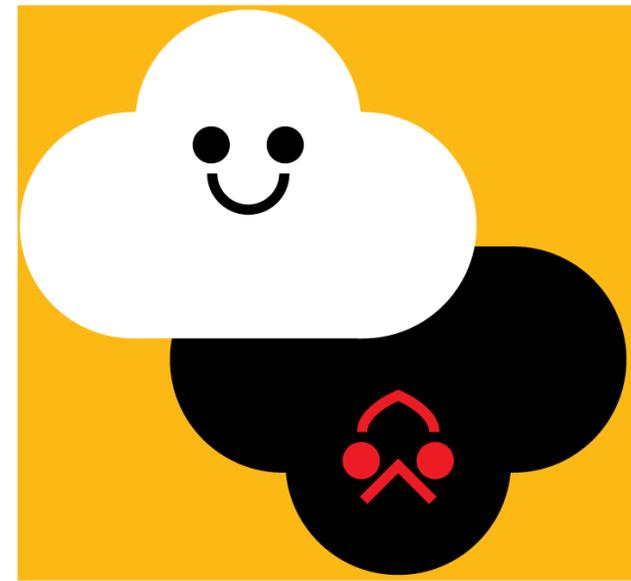
2016

it was a year with new climatic records:
- a global average temperature of **1.1 ° C** higher than the pre-industrial period
- the smallest glacier-covered area in the Arctic (**4.14 million km²**)



1,5 ° C

is the optimal limit set by the **Paris Agreement** for global warming, by reducing emissions and adapting to existing and future impacts of climate change. Maintaining this limit would significantly reduce the risks and impacts of climate change.



The greenhouse effect is a natural process that heats the surface of the Earth. Behind it are gasses (water vapor, carbon dioxide, methane, nitrogen oxide and chlorine and fluorine compounds) without them the planet would have an average temperature of -18°C , and life would not be possible. Greenhouse gases are also emitted by human activities. Together, the greenhouse effect and the man-made effect make temperatures rise to dangerous levels for life on Earth. Current climate change is due to the change in the planetary balance by the addition of man-made greenhouse effect.



Global warming

means the long-term warming of the planet. The one we feel is due to the large amount of greenhouse gases emitted over the last 200 years. They persist in the atmosphere for several months, several hundreds or thousands of years, and thus affect the planet for a long time.



Climate changes

include the global warming phenomenon, as well as other planet changes: increased sea and ocean levels, melting mountain glaciers, changes in plant and flower blooms, extreme weather phenomena, etc.





The negative effect of climate change has been felt so far and is set to increase in the future by increasing extreme weather phenomena such as floods, droughts and heat waves. The phenomenon affects and will affect many areas such as biodiversity, agriculture, water resources, forestry, infrastructure, energy, tourism and the health of the population.

60.000

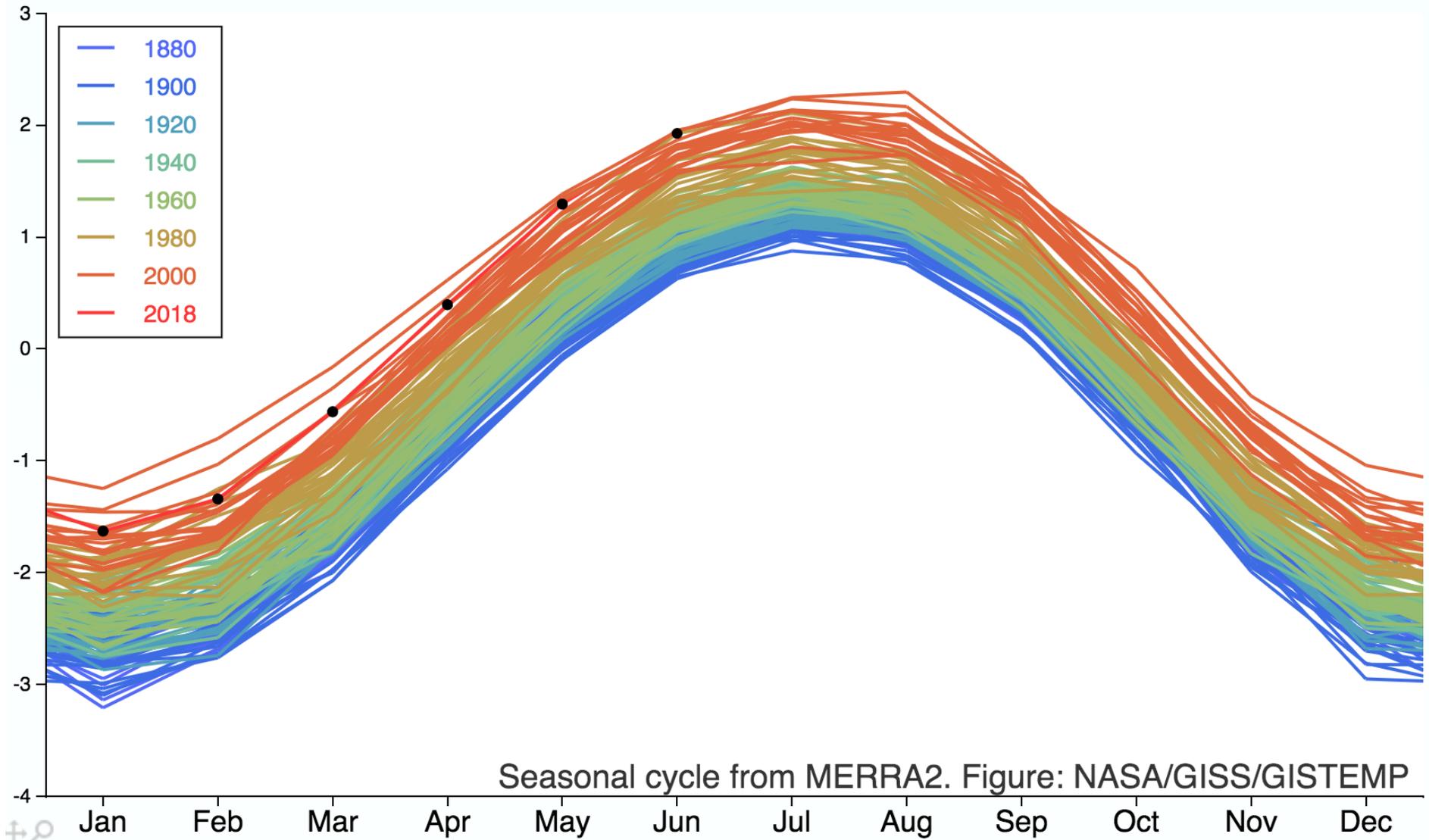
of deaths are estimated globally in 2030 due to the effects of climate change on air pollution, according to a recent study by the University of North Carolina. For 2100, their number would rise to 260,000.

~70.000

of deaths were recorded in Europe in 2003, in the hottest continental summers in recent history. France was the most affected (about 15,000 deaths).

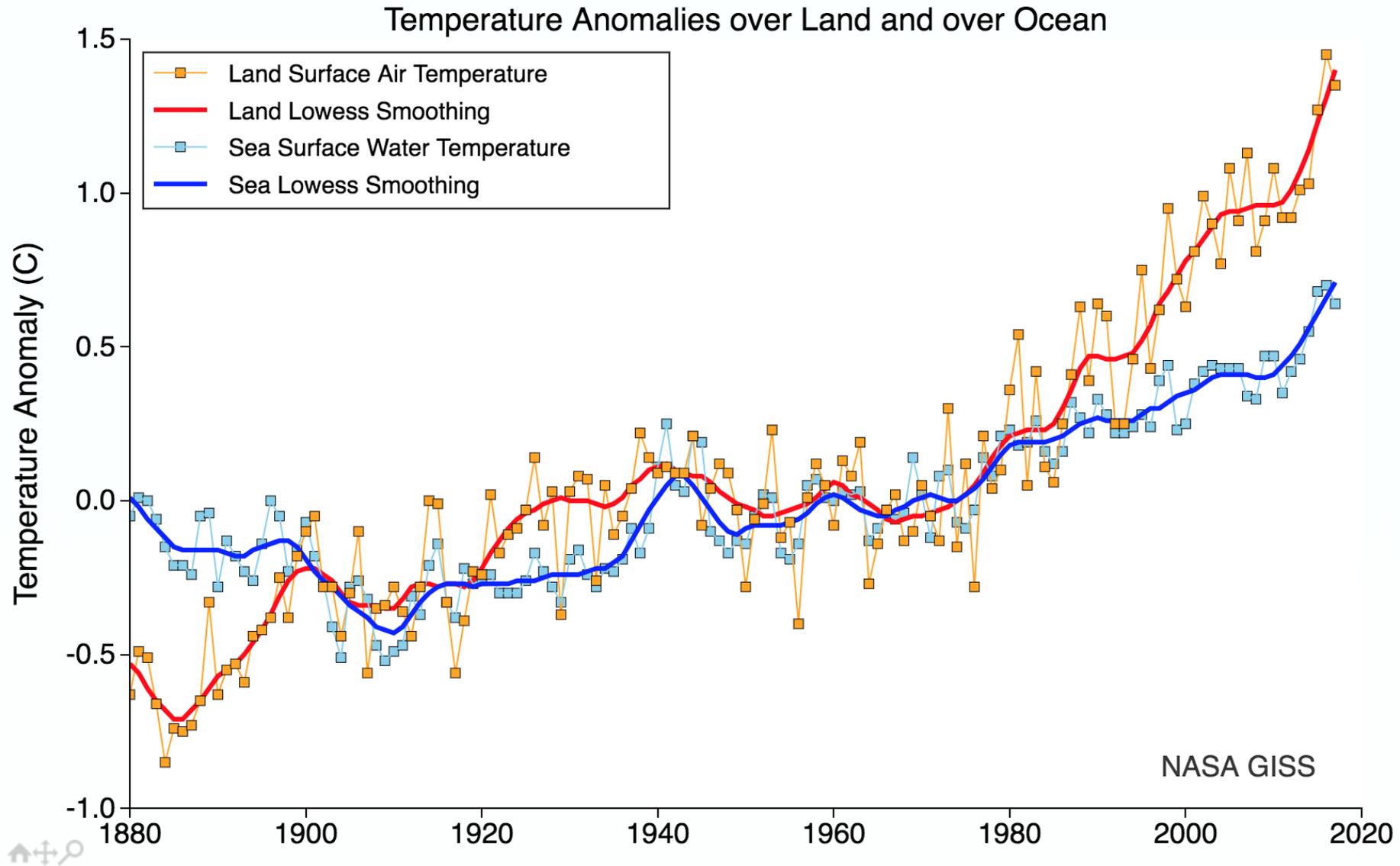
How much warmer each month of the GISTEMP data is than the annual global mean.

GISTEMP Seasonal Cycle since 1880



Derived from the MERRA2 (Modern-Era Retrospective Analysis for Research and Applications)

Annual (thin lines) and five-year lowess smooth (thick lines) for the temperature anomalies averaged over the Earth's land area and sea surface temperature anomalies.



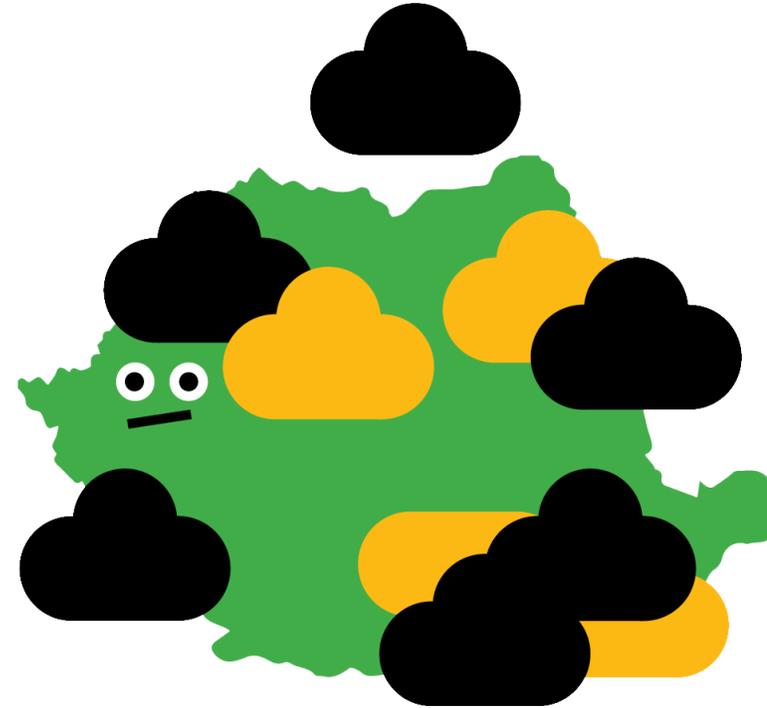
LOCAL CONTEXT

Deindustrialisation

after 1990 has led to a significant decrease in emissions in Romania. In 2015, their level was 56% lower than in 1989. However, the historical pollution inherited from the old regime, which consisted of more than 1,300 sites contaminated or possibly contaminated throughout the country, remained.

Temperature

The annual average air temperature increased in Romania by 0.8 ° C from 1901 to today and by more than 1 ° C in the S and SE of the country as a result of the global warming effect. The trend of growth has been observed especially since the 1960s, since the meteorological stations in the country have grown and since the global trend began to emerge.



June 2017

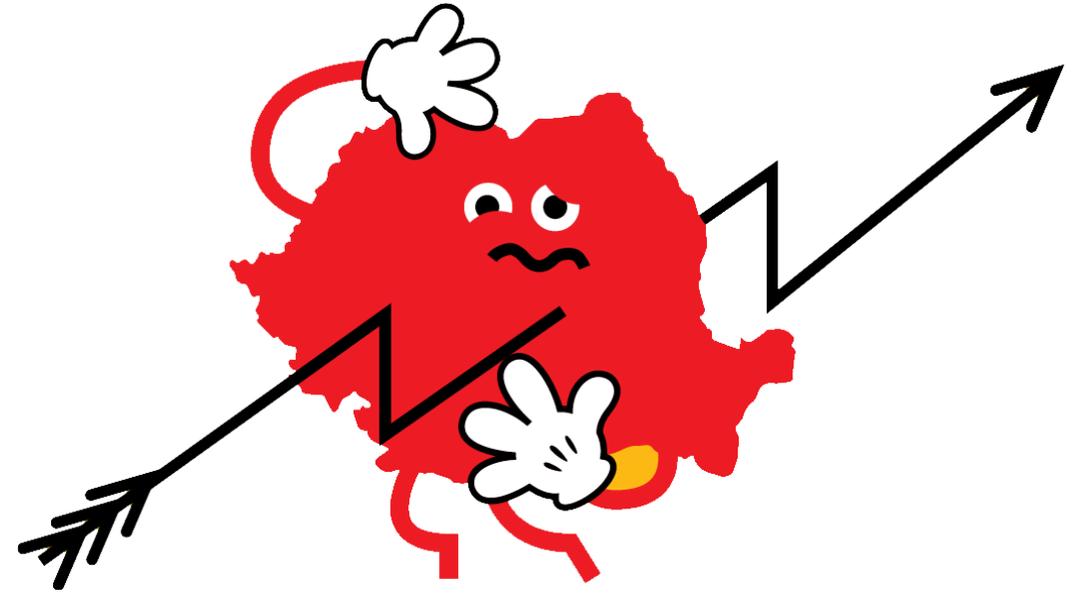
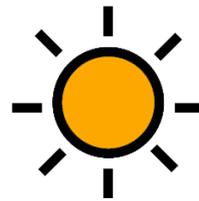
recorded an increase of 1.4 ° C in Romania compared to the average of June 1981-2010. In July, the increase was 0.4 ° C.

2012

was the year with the hottest summer since the measurements in Romania, by the number and especially the persistence of the heat days, with temperatures above 35 degrees, and the tropical nights, over 20 degrees.

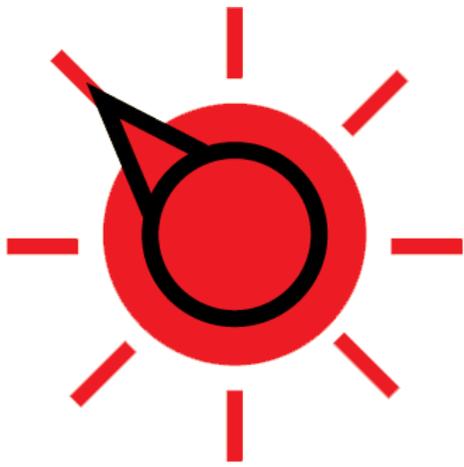
Scenarios

indicates increases in annual average temperatures ranging from ~ 1.5 ° C to ~ 2.5 ° C for the 2021-2050 period vs. 1961-1990 and from ~ 2.5 ° C to ~ 5 ° C for the period 2061-2090 vs. 1961-1990. The most affected region will be the South of the country, with estimated growths up to 5 ° C in the summer for the end of the century. The average temperature in the summer months could rise up to nearly 6 ° C in the worst scenario of increasing greenhouse gas concentrations.



Trend

which emerges from all the future scenarios proposed by the National Meteorological Agency (NMA) is the increase of average temperature in the country by the end of the century. The biggest increase will be recorded in the summer and then in the winter, and will be significantly lower in October and November.



Increase in the frequency of heat waves

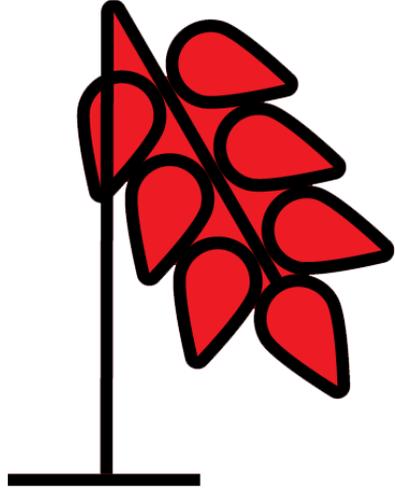
Heat waves (at least 2 days with a maximum temperature greater than or equal to 37 ° C) will be more and more common in the following decades, especially in the south-eastern, southern and western regions surrounding the Carpathian mountain chain.

They have a negative impact on public health (primarily affecting children, elderly people and people with cardiovascular and respiratory problems), agriculture, energy production, transport, tourism and labor productivity.



Increase in rainfall and diminishing it in summer

Scenarios show a decrease in average rainfall in the summer months, when water demand is highest. In S and SE, there is a noticeable decrease in rainfall. Experts estimate, however, that they will be intensifying for short periods of time and on small surfaces, especially in mountain areas. This may mean more frequent floods, longer droughts, lack of water resources, limited hydropower energy production, forest fire hazard, loss of biodiversity, soil and ecosystem degradation and desertification



Intensification of droughts

More severe droughts are announced by the end of the century, especially in the S and SE of the country, which will lead to the reorientation of crops in areas heavily affected. The economic sector most affected by drought and excessive rainfall is agriculture, especially plant production. Another consequence is the reduction of river flows and hydro-power production, in a context in which demand for energy will increase more and more in summer due to high temperatures.



Decrease in the snow layer

The average thickness of the snow layer will decrease steadily, with the Center, the West and the East of the country being the most vulnerable. The phenomenon also affects the production of hydropower, as well as water reserves for the population and agriculture as snow is an important source of water.

Urban heat island

Is a phenomenon produced by the urban environment with the disappearance of green spaces and the body of water in favor of concrete and asphalt, which retain the heat. This effect enhances the temperature in the cities, compared to the surroundings, accentuates the heat produced naturally. It adds to the effects of climate change and, together, can affect residents health, employee productivity, natural resources, or the GDP of cities.

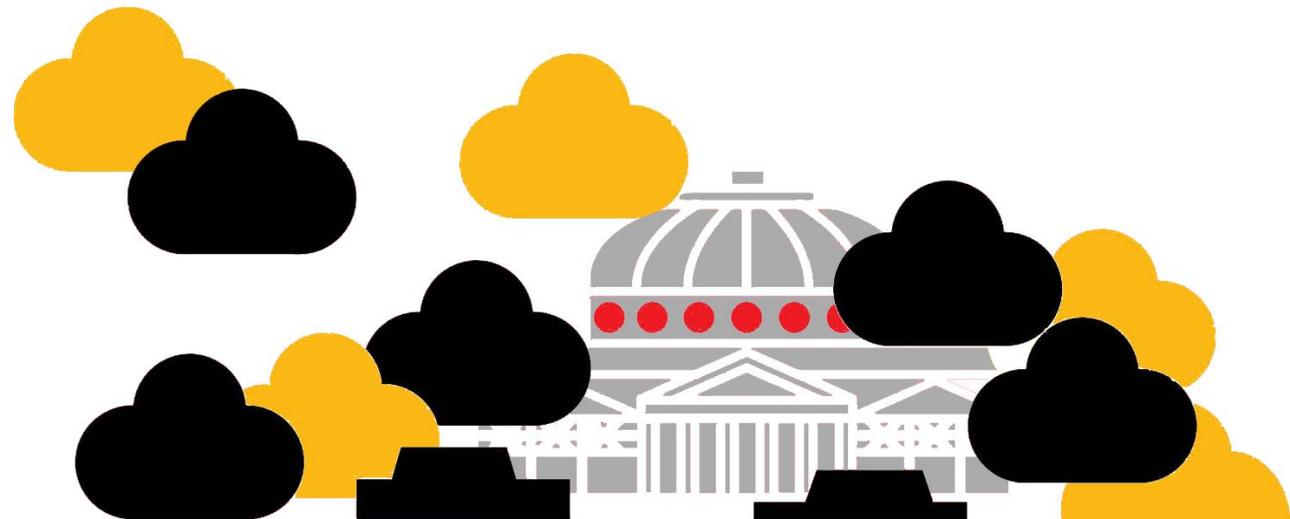
Bucharest

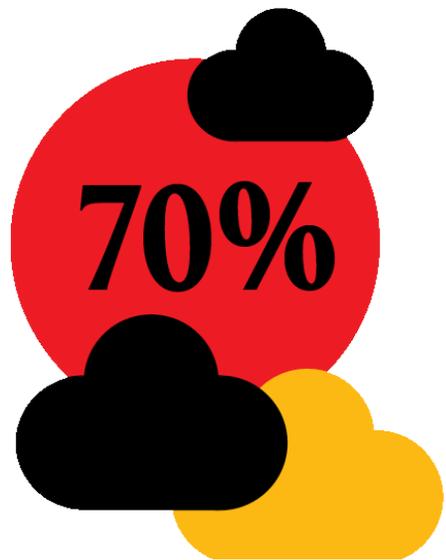
is the largest "heat island" in Romania and the city that would be most affected by the climatic effects.

1.7 mm per year

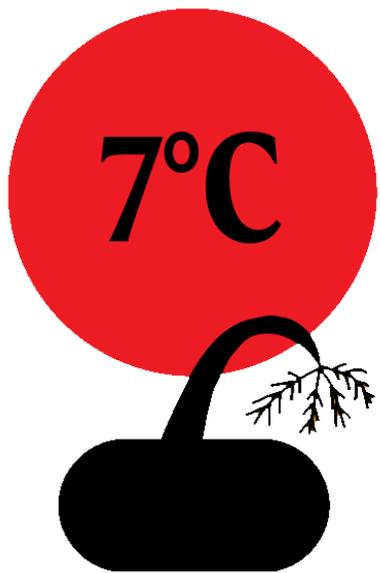


is the tendency in increase in the Black Sea level at present, it will be higher. Besides, the Black Sea is facing a decrease in salinity in the surface layer and oxygen level in deep waters and tends to freeze more often at the coast. These phenomena affect marine life and surrounding areas.

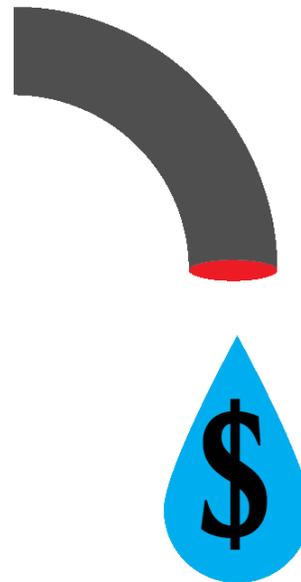




of the total CO₂ emissions from burning fossil fuels come from cities. Climate change caused by greenhouse gases affects cities mainly by increasing temperature and increasing and diminishing precipitation.



could be the rise in temperature in a in most populated cities by 2100, according to a study recently published in the journal Nature Climate Change. The blame would be the combined effect of global warming and island heat effect. In some of them, 5 ° C out of the 7 would be on the shoulders of global warming, the other 2 from the island heat effect.

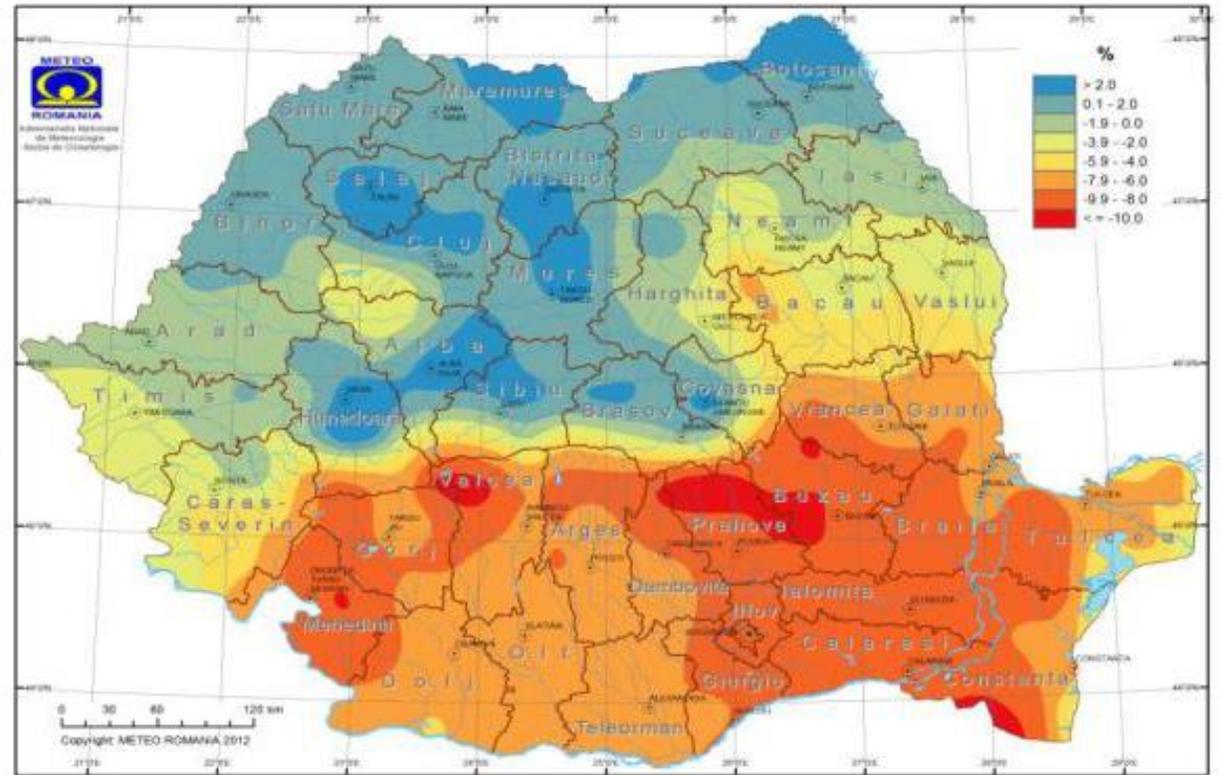
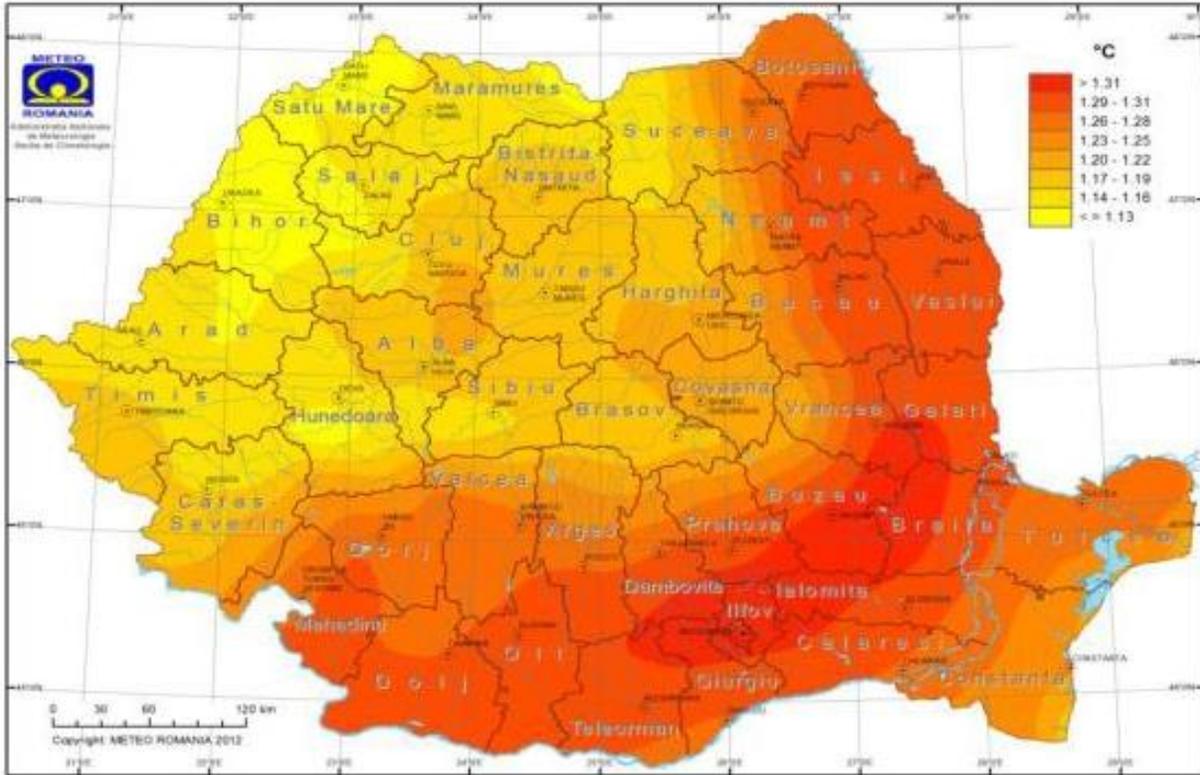


Reduce in rainfall, a phenomenon that will increase in Romanian cities, means less water resources in the future (lately, in Romania, there are situations where water supply is shut down in the cities due to the shortage). If the phenomenon is alarmingly amplified, it would attract and raise the price of water. In the US there are already so-called “pockets of water poverty”, areas where people can no longer afford to cover water costs for utilities.



Both the population of the cities and especially the authorities, must seek solutions to adapt to the existing climate conditions, mitigation and their avoidance.

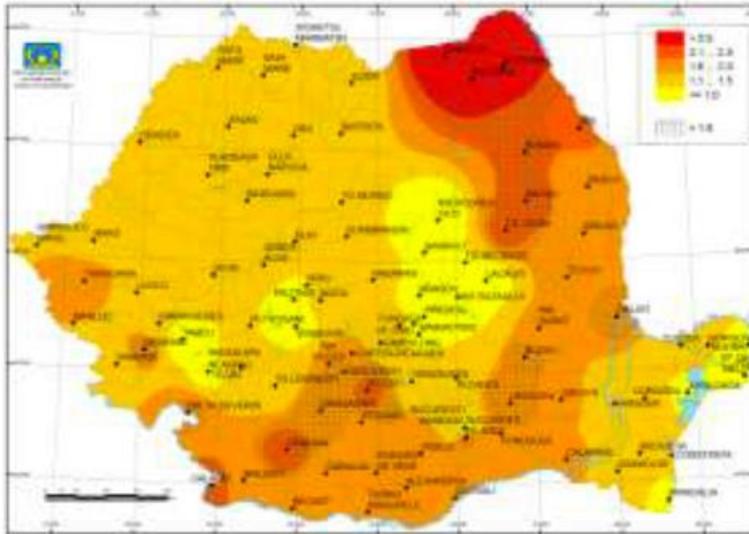
Over the past 100 years, Romania has experienced a rise in temperature, accompanied by a drop in precipitation. Romania has a temperate-continental transition climate, and the average temperature in the Danube Delta region, for example, is 10-12 ° C. The average annual air temperature increased by 0.8 ° C between 1901-2012. In terms of precipitation, analysis of data recorded at the same time revealed a decrease in the annual rainfall by 23.6 mm.



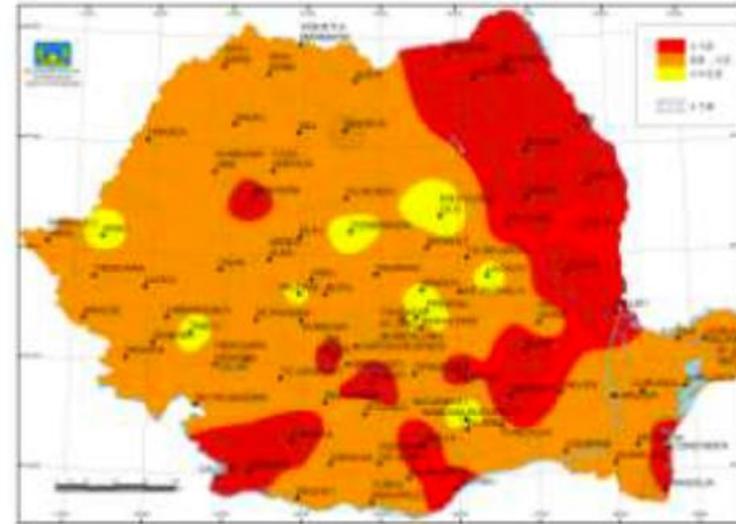
Multiannual average changes (2011-2040 vs. 1916-1990): air temperature (in ° C to the left) and rainfall (in % on right).

A significant warming of about 2 ° C throughout the country during the summer, in the extra-Carpathian regions in winter and spring, with higher values in the eastern part, exceeding 2 ° C (winter) and 1 ° C (spring).

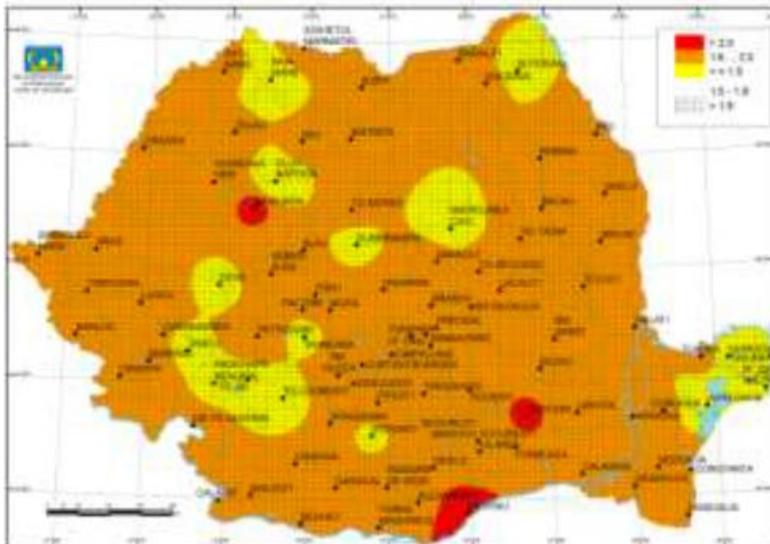
winter



spring



summer



autumn



National Climate Change Strategy

Has two key components of climate effort:

- ❖ to prevent and combat the effects of climate change (through actions to reduce greenhouse gas emissions)
- ❖ adequate adaptation and minimal damage in the context of climate change already underway

Proposes types of key measures to be implemented in each sector to reduce green house gas emissions and adapt to the effects of climate change;

It reviews the main action programs at national level with impact on climate change in various sectors: industry, transport, forestry, agriculture, urban, etc.

It bases the principles that will form the basis of the elaboration of the plans and action programs at the sectoral level, establishes the general and specific objectives that will have to be achieved through future measures and actions, determined according to the specific of each sector.

This is a landmark for Romania's "green growth", that is, economic development based on low greenhouse gas emissions.

Types of measures

Energetic efficiency:

- Changing households' behavior, which can lead to savings of 1-15% through the proper use of home appliances, lighting systems and thermostatic regulators for thermal energy;
- Attracting private investment in municipal projects, using the performance contract, with estimated savings of 15% for public buildings and 25-30% for public lighting projects;
- Reduce energy consumption in industry by at least 10% by improving energy management and applying "low-cost / no-cost" measures.
- Promoting energy management in industry by:
 - information and training for authorized energy managers;
 - developing a new model of training course for the agreed universities in preparation for the authorization of energy managers and auditors.

Transport

- encouraging the use of rail transport as an alternative to Road transport and the orientation of road freight transport to Rail transport.

Auto

- Vehicles equipped with conventional (internal combustion) engines, but with very low pollutant emissions;
- Vehicles equipped with conventional (internal combustion engine) engines that use partially or full alternative fuels (generally liquid biofuels, biogas, LPG, etc);
- Vehicles with other power sources (hybrid, electric, hydrogen, etc.)

Types of measures

Urban

- Improving the thermal performance of buildings. It will be continued, for example, the thermal rehabilitation of existing buildings;
- Encourage the development of projects targeting green houses, passive and / or active houses. The program started in 2010 to install heating systems using renewable energy, including the replacement or completion of classical heating systems, called the "Green House Program", will be improved and its implementation will continue in the years to come;
- Implementing a support program to improve energy efficiency in buildings occupied by low-income people;
- Modernization of the transport and distribution infrastructure of the thermal energy in centralized systems;
- Implementation of the project of forest curtains to protect large cities in the plains.

Agriculture

- Introduction of modern agricultural technologies for the use of drought resistant plants, diseases and pests, for which fewer agrotechnical works are needed;
- Protecting organic matter in soil, especially in carbon-rich soils (marshes, peatlands, etc.);
- Implementation of technologies for collection and recovery of agricultural residues;
- Making micro-installations for obtaining biogas in the farm or in groups of farms;
- Increase in forest area by stopping illegal logging, ecological forest reconstruction.



Earth is your home too!
Take care of her!