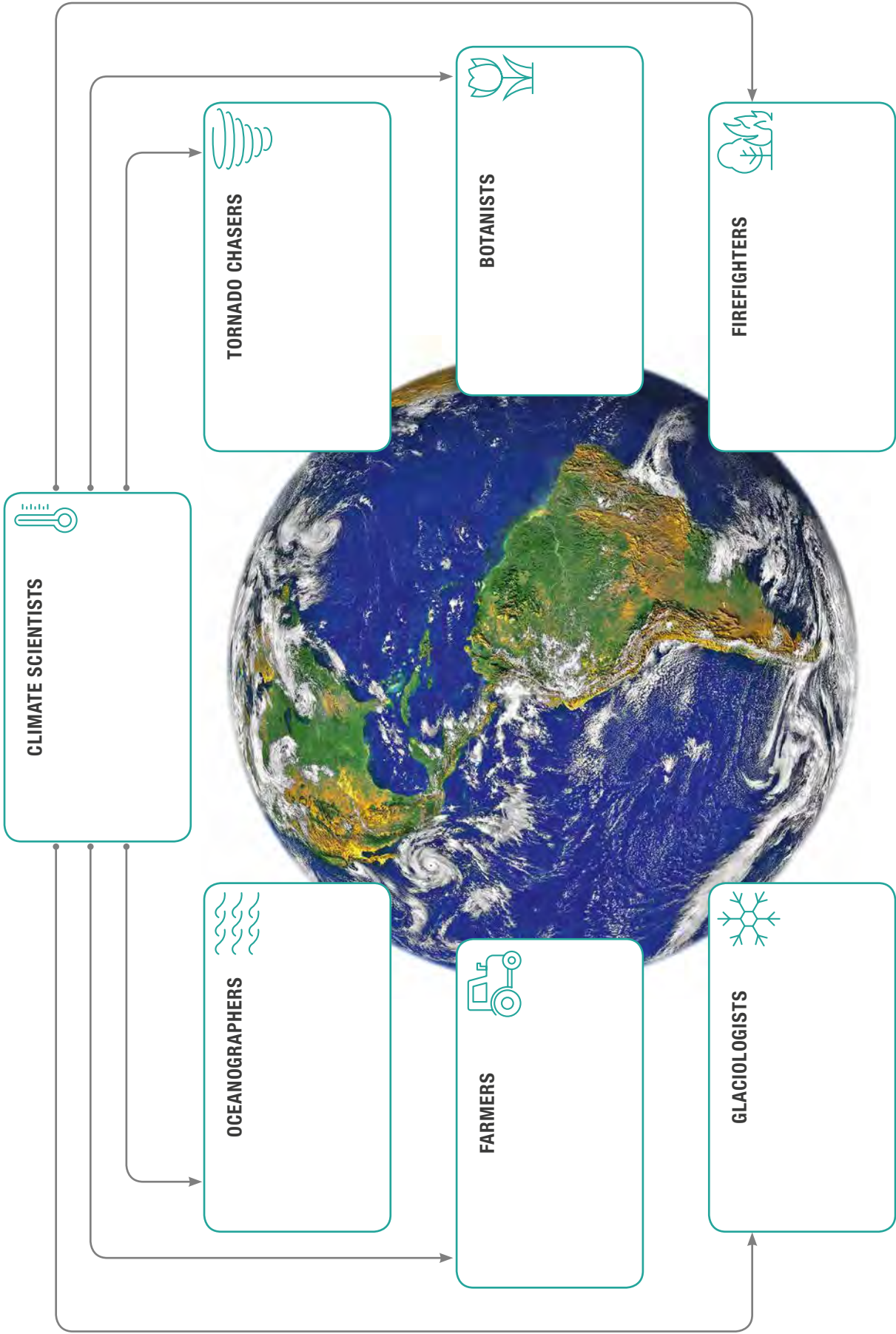




WORKSHEET A1.1



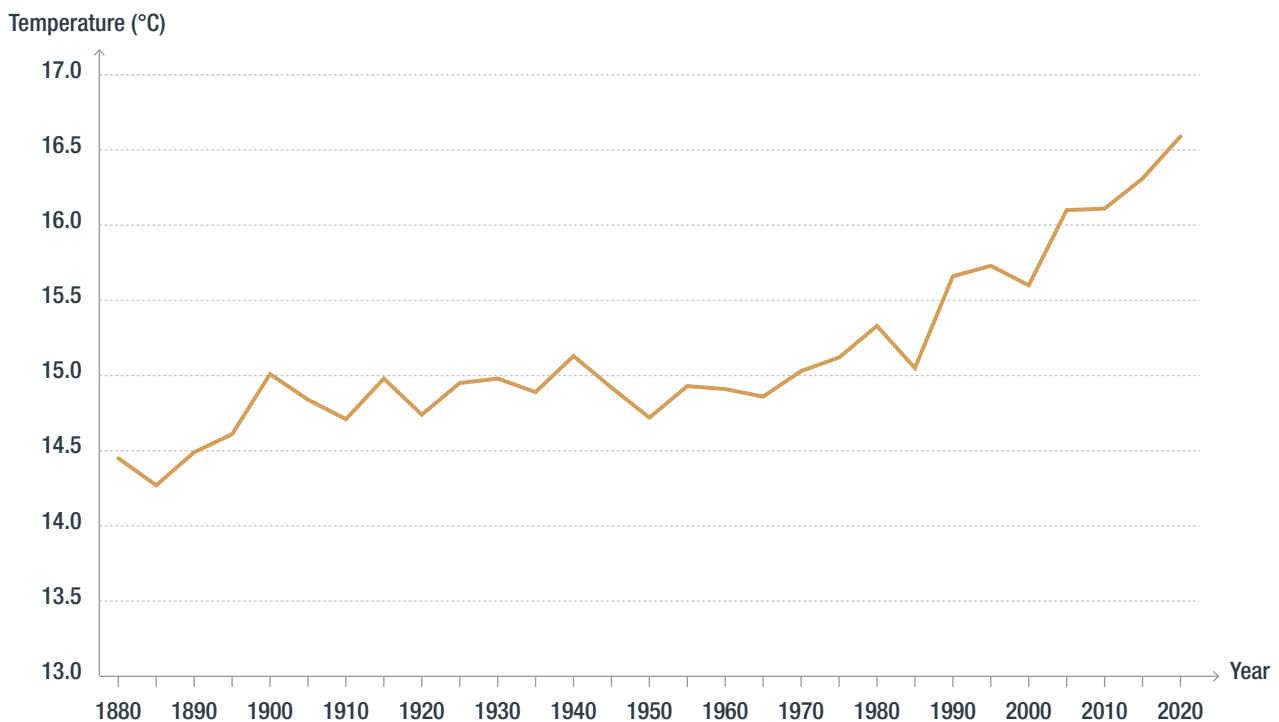


CLIMATE SCIENTISTS

➔ **Your mission:** As climate scientists, you would like to know how the temperatures have changed over the last century. Using the graph below, describe in a couple of sentences what you notice about the temperature change on Earth since 1880.

This graph shows the change in the Earth's temperature above land since 1880. These measurements come from the NASA website and were obtained using different weather stations across the globe.

EVOLUTION OF THE TEMPERATURE ABOVE LAND SINCE 1880



Source : https://data.giss.nasa.gov/gistemp/graphs_v4/

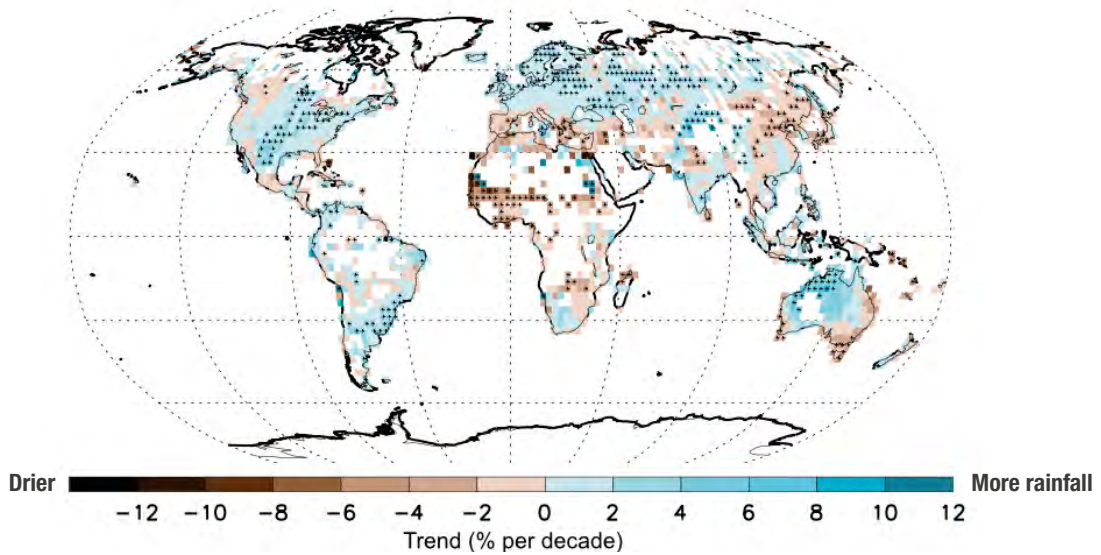


EXPERT CLIMATE SCIENTISTS

➔ Your mission: As expert climate scientists, you would like to know how climate has changed over the last century. Using the figures below, describe in a couple of sentences what you notice about precipitation and temperature changes on Earth since 1950.

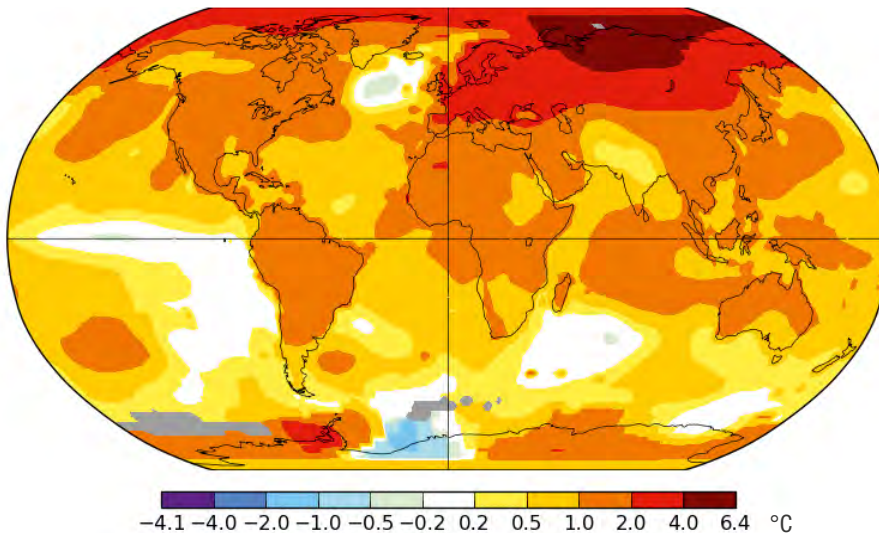
The two figures illustrate the evolution of precipitation between 1951 and 2010 and the changes in temperature between 1950 and 2020.

TRENDS IN PRECIPITATION OVER LAND BETWEEN 1951 AND 2010



Source: IPCC Assessment Report 5 – WG1

CHANGES IN MEAN ANNUAL SURFACE TEMPERATURE IN 2020 COMPARED TO THE PERIOD 1950–1980



Source: NASA – https://data.giss.nasa.gov/gistemp/maps/index_v4.html

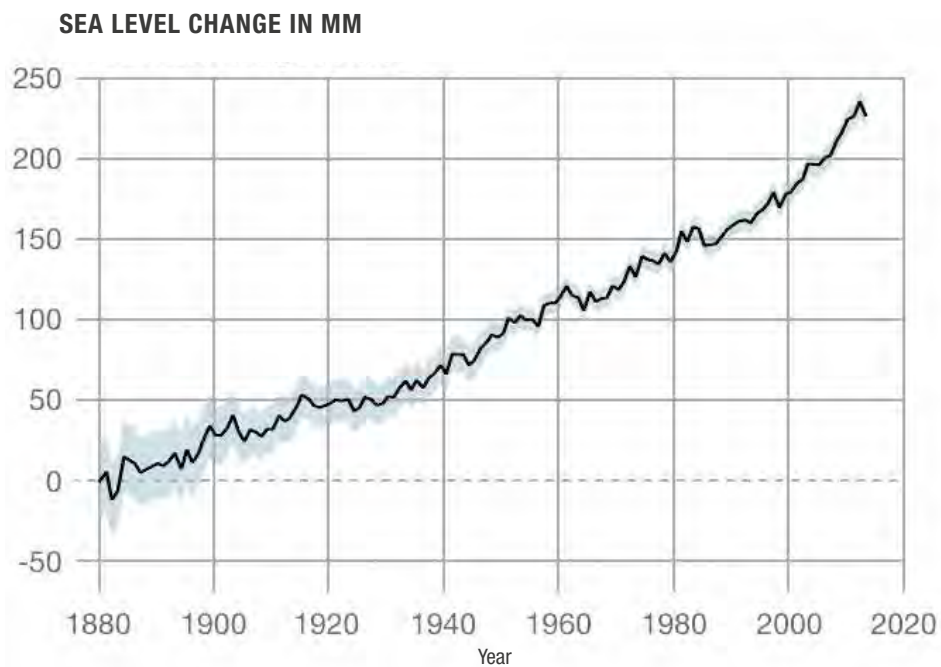
A NASA video is also available to help visualise the increase in temperature since 1880: <https://svs.gsfc.nasa.gov/4882>



OCEANOGRAPHERS

➔ **Your mission:** As oceanographers, you would like to know how sea level has changed over the last century. Using the graph below, describe in a couple of sentences what you notice about the change in sea level since 1880.

This graph shows sea level variations since 1880. Recent measures were obtained using satellites revolving around the Earth and continuously recording the sea level, whereas the oldest ones come from littoral sea gauges¹.



Source: data from NASA – <https://climate.nasa.gov/vital-signs/sea-level/>

¹ A sea gauge is a recording device that measures the sea – or river – level in a specific place and for a certain amount of time.



FARMERS

➔ Your mission: As farmers, you are concerned about climate change. Using the following information, write a couple of sentences explaining what a drought is and how the number of people affected has changed since 1960.

The first part describes what a drought is and its consequences. The second focuses on the amount of population experiencing desertification. Desertification occurs when the land is damaged in a dry area; it then becomes more and more arid and looks like a real desert.

WHAT IS A DROUGHT?

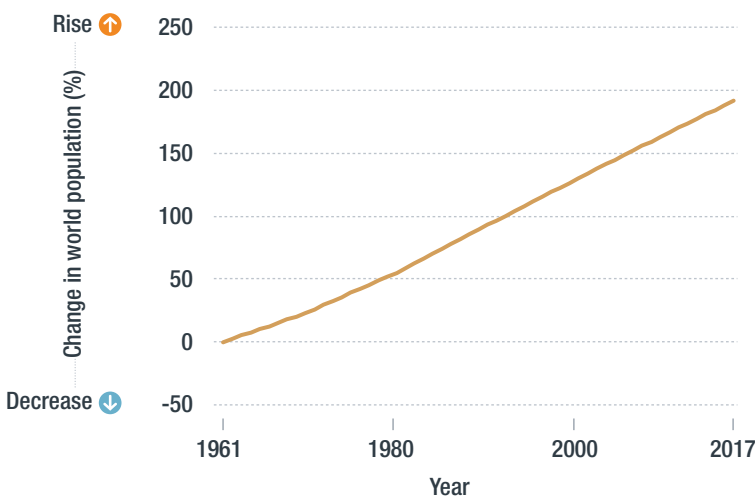
Drought occurs when there is less precipitation (rain) than usual or when the temperature is so high that groundwater reserves begin to run out.

Plants, like all living things, need water to survive and grow. When there is a drought, farming becomes very difficult.

If the drought lasts too long or is very severe, it can lead to desertification.



CHANGE IN WORLD POPULATION EXPERIENCING DROUGHT RELATIVE TO 1960



Source: Adapted from the IPCC's Special Report on Climate Change and Land.



GLACIOLOGISTS

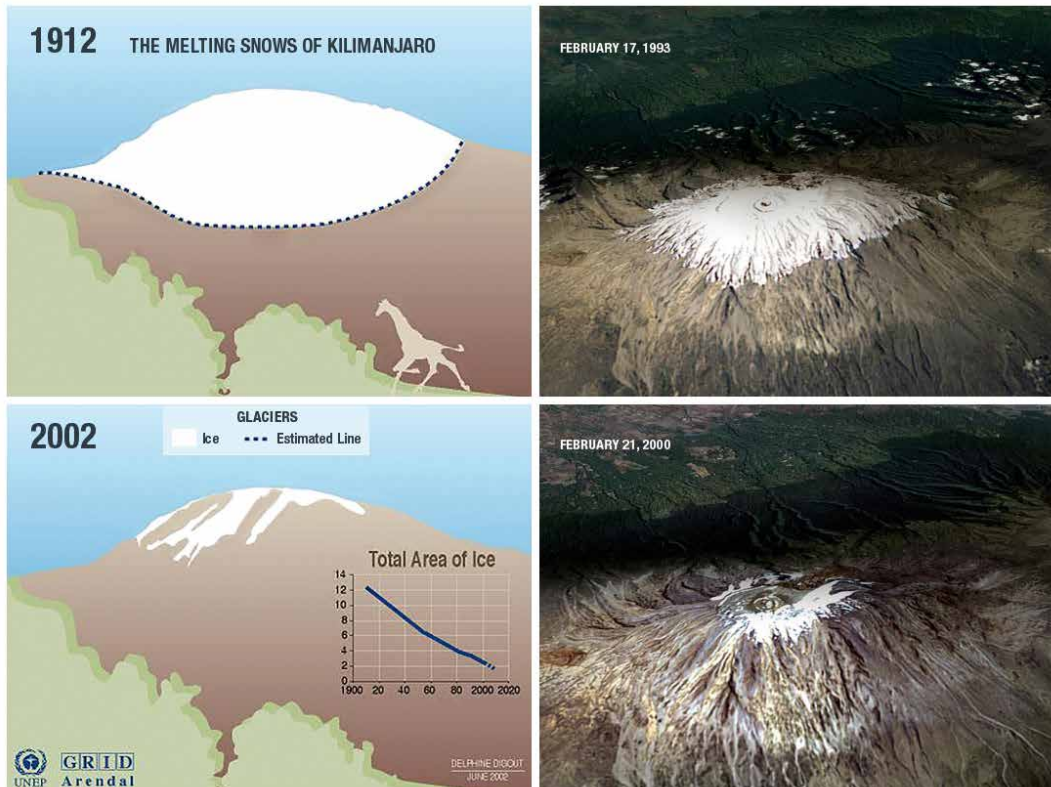
➔ Your mission: As glaciologists, you are concerned about climate change, wondering if it will still be possible for you to study glaciers in the future. Using the following article, write a couple of sentences explaining what has happened to the Kilimanjaro glaciers since 1912.

The following article describes how the Kilimanjaro glaciers have changed between 1912 and 2002.



KILIMANJARO IS DYING!

The glaciers of Mount Kilimanjaro, the highest peak in Africa, which have covered the top of the mountain for the past 11,700 years, are rapidly disappearing: “[...] in 1912, there were about 12.1 square kilometers of ice on the mountain, but a map in 2000 showed only 2.2 sq km of ice remained on the mountain – a loss of 80% of ice since then. [...] Kilimanjaro’s location [...] places it in the tropics. Here, ice fields are particularly susceptible to climate change, and even the slightest temperature fluctuation can have devastating effects.”



Source: Adpated from <http://www.earthkam.org>



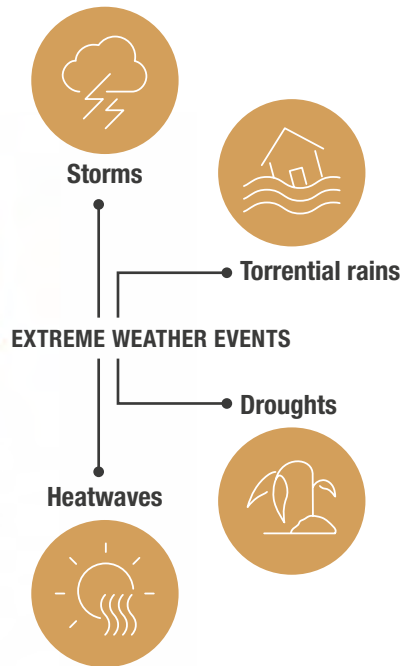
TORNADO CHASERS

➔ Your mission: As tornado chasers, you wonder if it will still possible to take pictures of tornadoes, despite climate change. Using the following graph, write a couple of sentences on what extreme weather events are and how their number has changed since 1900.



The following graph shows the change in the number of extreme weather events occurring since 1900. Extreme weather events are those that are out of the ordinary, often because they are more powerful (e.g. tornadoes, torrential rains, droughts or heat waves). They can lead to forest fires or floods and cause a lot of damage.

NUMBER OF EXTREME WEATHER EVENTS RECORDED ON THE PLANET



Source: EMDAT (2019): OFDA/ CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium. <https://ourworldindata.org/natural-disasters> – CC BY



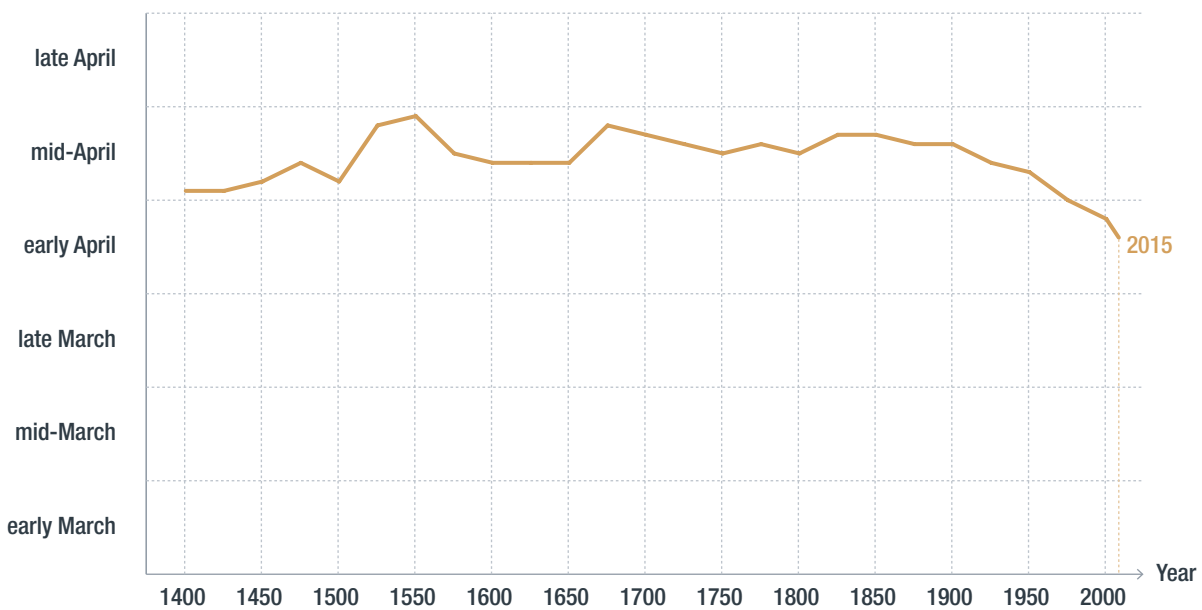
BOTANISTS

➔ **Your mission:** As botanists, you wonder how plants will react as the global temperature increases. Using the following graph, write a couple of sentences explaining how the blossoming date has changed over the last 600 years, and how this is related to climate change.

The following graph shows the evolution of the blossoming date of cherry trees in Japan over a period of 600 years. The blooming occurs when temperatures are high enough.



EVOLUTION OF THE BLOSSOMING DATE



Source: Aono and Kazui, 2008; Aono and Saito, 2010; Aono, 2012; Chikyu Kankyo (Global Environment), 17, 21–29
<http://atmenv.envi.osakafu-u.ac.jp/aono/kyophenotemp4/>



FIREFIGHTERS

➔ **Your mission:** As firefighters you are concerned that forest fires may become more frequent with global warming. Using the maps below, write a sentence explaining how the fire season has changed and how it relates to climate change.

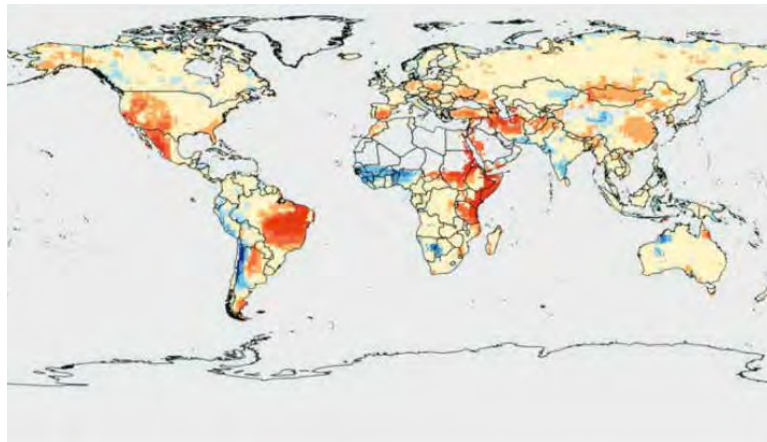
The following maps show the evolution of fires worldwide between 1996 and 2013 compared to 1979-1996. The first one shows the change in the length of the fire weather season, whereas the second shows the change in the frequency of fire events. Wildfires may be caused by humans – willingly or otherwise – but are also more frequent in the case of droughts or heatwaves.



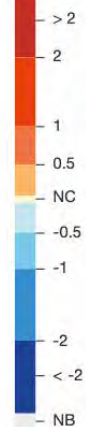
GLOBAL PATTERNS OF FIRE WEATHER SEASON LENGTH CHANGES FROM 1979 TO 2013

- A. Areas that show modifications in fire weather season length
- B. Regions that have experienced changes in the frequency of long fire weather seasons

A FIRE WEATHER SEASON LENGTH CHANGE (DAY PER YEAR)

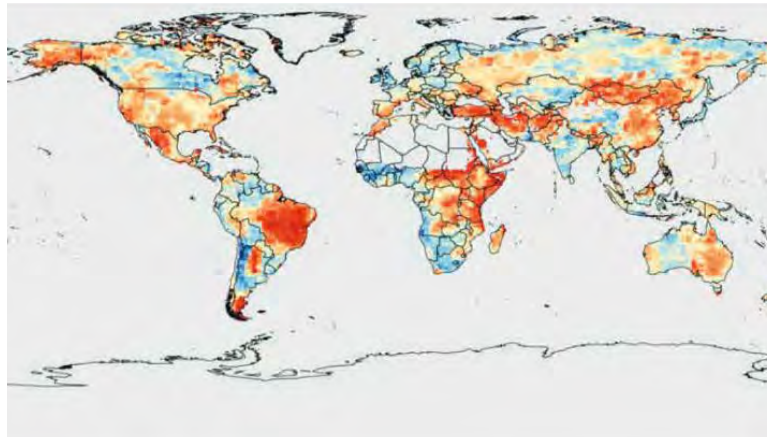


Longer season

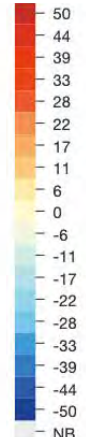


Shorter season

B LONG FIRE WEATHER SEASON EVENT FREQUENCY CHANGE (%)



More frequent



Less frequent

Source: The IPBES assessment report on land degradation and restoration. https://ipbes.net/sites/default/files/2018_ldr_full_report_book_v4_pages.pdf