

Kingdom of Saudi Arabia.

Ministry of education.

Medina area.

Twenty-fifth high school.



Global Warming – The biggest threat of the 21st century.

Scientific research submitted as one of the requirements for the course
“Research Skills and Information Sources.”

Author’s name:

Farah S. Sabra

Supervisor:

Mrs. Badria Al-Qarni

Year:

2021/2022

Table of Contents:

| PAGE NO. | CONTENTS |
|-----------------|---|
| 3 | INTRODUCTION |
| 4 | ABSTRACT – IMPORTANCE – FIELD - METHODOLOGY |
| 5 | RESEARCH AIMS AND QUESTIONS |
| 6 | DEFINITIONS OF TERMS |
| 7-8 | PREVIOUS RESEARCH |
| 9-10 | GLOBAL WARMING AND ITS CAUSES. |
| 11-12 | EFFECTS OF GLOBAL WARMING. |
| 13-14 | FUTURE PERIDCTIONS AND WAYS TO PREVENT THEM. |
| 15-16 | CONCLUSION |
| 17-18 | REFERENCES |
| 19-23 | PICTURES, DIAGRAMS, AND MAPS. |

Introduction:

When we are asked to close our eyes and imagine a quiet place to escape hardships and stress, we often find ourselves imagining a vast field where we listen to the chirping of birds and enjoy the clear breeze, or we would imagine a beach where we watch the waves crash against the soft sand beneath our feet. Such fantasies refill our souls with the energy needed to keep going. We, as human beings, find our peace in nature, but what if I told you that we are slowly being stripped of that privilege while being completely oblivious? Yes, you have read that correctly. We are losing nature at a faster rate than it can revive itself.

In an age where information travels at the speed of light, you would think that we would be more aware of the environmental and global issues that threaten life on our planet, but unfortunately this is not the case. Global warming is similar to a house that has been engulfed by fire, devouring every corner of it, while those who live in that house - humans - are still unaware of the danger that those fires pose to them, and that is where the responsibility falls on our shoulders. We must do our part to save the rest of our planet and bring it back to life before it is too late.

In an attempt to raise awareness of this phenomenon, I have devoted my research to this topic where I will discuss the definition of this phenomenon, its causes and effects on the environment, along with suggesting some solutions to avoid any future damage caused by it, aiming that it would serve as a wake-up call to all those who are still living in ignorance of this phenomenon.

Abstract:

Global warming is a profoundly genuine issue that threatens life on our planet, yet many of us are still oblivious to its causes and harms.

Research importance:

- Global warming is a life-threatening issue to all shapes of life and its danger is in constant increase.
- The importance of taking strict and fast actions to stop global warming.
- The lack of awareness with this phenomenon.

Research field:

Facts research.

Research methodology:

Historical method.

Research aims:

- i. Defining global warming and its causes.
- ii. The effects of global warming.
- iii. Future predictions and ways to prevent them.

Research questions:

- i. What is global warming?
- ii. What are the causes of global warming?
- iii. What are the GHGs?
- iv. What are the effects of global warming on different sides of life?
- v. What are the future predictions for global?
- vi. How do we avoid the dangers of global warming in the future?

Definition of terms:

| TERM | DEFINITION |
|--|---|
| GLOBAL WARMING¹ | an increase in the earth's atmospheric and oceanic temperatures widely predicted to occur due to an increase in the greenhouse effect resulting especially from pollution |
| GHGS² (GREENHOUSE GASES) | They are gases found in the atmosphere of the planet, and they are characterized by their ability to absorb the infrared rays emitted by the Earth and keep them and raise the temperature of the air, thus reducing heat loss from the Earth to space. |
| BLACK CARBON³ | It is a substance resulting from the incomplete combustion of products containing hydrocarbons, such as heavy derivatives of petroleum. |
| SMOG⁴ | It is a mixture of fog and smoke that forms over industrial areas and cities and is caused by emissions and exhausts from factories and cars. |
| ECOSYSTEMS⁵ | Any natural space and its contents of living plant or animal organisms or non-living materials, some consider it the main unit of ecology. |
| WATER STRESS IN PLANTS⁶ | It is the damage caused to the plant as a result of exposure to a shortage or excess of water in its environment than the optimum limit for growth. |

¹ Webster Dictionary

² Wikipedia: <https://www.wikipedia.org/>

³ Previous reference

⁴ Previous reference

⁵ Previous reference

⁶ <https://m.akhbarelyom.com/news/newdetails/3452657/1>

Previous research:

I. Name of the Conference: The Twenty-sixth Session of the Conference of the Parties (COP26)⁷.

Organizer: United Nations (UN)

Conference date from: October 31, 2021, **to:** November 12, 2021

Location: Glasgow, Scotland.

The most important results obtained:

- Reaffirming the goal of the Paris Agreement (2015), which is the recognition of the state of emergency and the emphasis on limiting the increase in the average global temperature to 1.5 °C, as they recognized that impacts of climate change will be lower at a temperature increase of 1.5 °C.
- The most controversial decision taken was to move away from fossil fuels, but the countries agreed on a clause calling for the gradual phase-out of coal energy and the phasing out of fossil fuel subsidies.
- Countries have recognized that climate change has impacts on people in developing countries and have agreed to strengthen a network - known as the Santiago Network - that links affected countries with aid providers to address climate risks.
- Launching the new "Glasgow Dialogue" to discuss arrangements for financing activities to avoid, reduce, and address losses and damages associated with the adverse effects of climate change.

There were also declarations and agreements outside the scope of Glasgow climate, if implemented, there will be many positive effects, **the most important of those were:**

- 137 countries took significant steps forward by committing to halting forest loss.
- 103 countries have signed the Global Methane Pledge, which aims to reduce methane emissions by 30% by 2030, compared to emissions levels in 2020.

⁷ <https://www.un.org/ar/climatechange/cop26>

- More than thirty countries and six major vehicle manufacturers have set out their determination that all vehicle sales will be zero-emissions vehicle by 2040 globally and 2035 in leading markets, accelerating the decarbonization of road transport.
- The leaders of South Africa, the United States, France, Germany, and the European Union also announced an agreement that states that South Africa will receive \$8.5 billion over the next 3-5 years to make a just transition away from coal to a low carbon economy.

II. Study name: The phenomenon of global warming and its relationship to human activities and natural disasters

Release year: 2009

Prepared by: Hassan Shaker Aziz Al-Kufi.

Description of the study: The study aims to review the volume of natural disasters caused by the phenomenon of global warming, by determining the role of human activities in emitting greenhouse gases and polluting the atmosphere, then the objective discussion of the causes of climate change and the role of human activity on the one hand, and the role of variations in the intensity of radiation Solar and Earth's orbit on the other hand in the phenomenon of global warming.

Study conclusions and recommendations:

- The phenomenon of global warming is a scientific fact based on scientific research and documented data and statistics.
- The greenhouse gases corresponding to carbon dioxide, water vapor, methane, nitrous dioxide, and nitrogen trifluoride are responsible for the global warming that our planet is experiencing.
- The phenomenon of global warming caused climate change and climate extremism, which led to various climate disasters that occurred in recent decades.
- The responsibility lies with the major industrialized countries to find appropriate and quick solutions to climate change, as they are the main cause of this phenomenon.
- A team of scientists believes that the reason behind climate change is the result of solar activity or the difference in the Earth's orbits.

Global warming and its causes.

Hana Issa showed in a jurisprudence study (2018) that God Almighty has created the universe on a tight system, everything is based on accurate estimation, interdependence, and integration, God Almighty said in the Holy Qura'n:⁸

(وخلق كل شيء فقدره تقديراً).

And this verse means that Allah has altered everything that He created and prepared it for what is suitable for it, so there is no defect in it, and there is no discrepancy. (Al-Tabari, 2010)

Therefore, any change that occurs to that balance leads to grave consequences such as global warming. The word “global warming” has become one of the most widely used words of our time, and this phenomenon has received a huge amount of attention around the world and in the few past years, but what is global warming?

Global warming is the occurrence of an increase in the temperatures of the atmosphere and oceans on a large scale due to the increase in the effect of greenhouse gases caused particularly by pollution.⁹

The main reason for this phenomenon is the increase in the percentage of greenhouse gases in the atmosphere, and greenhouse gases are gases that are found in the atmosphere of the planet which are characterized by their ability to absorb the infrared radiation emitted by the Earth, retain it, and raise the air temperature, thus reducing the loss of heat from Earth to space¹⁰. If the amount of these gases in the atmosphere increases, their impact will increase, which leads to the increase in Earth's temperature -global warming.

The most common greenhouse gases:

- | | | |
|----------------------------|-----------------------------------|-----------------------------------|
| 1) CFCs | 2) Nitrous oxide N ₂ O | 3) Carbon dioxide CO ₂ |
| 4) Methane CH ₄ | 5) Water vapor H ₂ O | 6) Ozone O ₃ |

(Center for Media Research and Studies, 2019).

⁸ The Holy Qura'n [Al-Furqan, from the verse:2]

⁹ Webster Dictionary.

¹⁰ Wikipedia: <https://www.wikipedia.org/>

There are several reasons for this increase, including:

I. Deforestation:

Plants in general consume carbon dioxide to produce oxygen. If forests are removed, the green cover will decrease which will reduce the amount of carbon dioxide consumed in photosynthesis, and its proportion in the atmosphere will rise.

II. Volcanoes:

One of the natural causes that humans do not interfere with is volcanic eruptions. Volcanic eruptions are always accompanied by the emission of carbon dioxide gas in the air in huge quantities and in lava during the explosion, in addition to dust and other toxic gases, including sulfur dioxide (SO₂) and hydrogen sulfide (H₂S).¹¹

III. Burning fossil fuels:

Since the start of the industrial renaissance at the beginning of the nineteenth century, industrially developed countries have relied heavily on fossil fuels, especially coal, to generate the energy needed to run machines and drive cars. However, that process produces what is known as black carbon, which can affect the formation of Clouds and rain patterns. When carbon covers snow and ice, the radiations from the sun are absorbed rather than reflected into the atmosphere. (Elias, 2021)

IV. Air conditioners and refrigerators:

The air conditioners and refrigerator that are used daily especially on summer days in fact have a hand in global warming. The chemical compounds responsible for the cooling effect, in air conditioners and refrigerators, are chlorofluorocarbons - better known by their common name "freon" –have a greenhouse effect similar to carbon dioxide. (Schlossberg, 2016)¹²

¹¹ <https://scied.ucar.edu/learning-zone/how-climate-works/how-volcanoes-influence-climate>

¹² <https://www.nytimes.com/2016/08/10/science/air-conditioner-global-warming.html>

The effects of global warming:

Signs of global warming are everywhere, and they are more complex than just rising temperatures. Similar to any phenomenon, global warming has its effects on many distinct aspects on Earth, such as:

I. Natural Environments:

The continuous rise in temperature leads to the melting of ice and glaciers in both the Arctic and Antarctic, which puts the polar species that live there at the risk of extinction due to the loss of their natural habitats (Elias, 2021), and the excess water that was once trapped in the form of ice is now released into the ocean, leading to a rise in sea levels at a tremendous rate, which threatens coastal areas and islands and those who live on them (Sciama, 2015), and tropical areas have been exposed to water scarcity, and plants suffer from water stress as a result of the increased rate of drought (Tadesse, 2010)¹³.

II. Weather:

Warmer temperatures make the weather more extreme, which means more storms, floods, and heavy snowfalls¹⁴, and more precipitation which is likely to cause costly damage to human structures, such as landslides. (Sciama, 2015). It also means long and frequent droughts.

This drought and warmer weather could lead to many disasters, such as the forest fires in Australia in 2019-20.¹⁵

III. Agriculture and Irrigation:

These climate changes pose a threat to the food resources of both animals and humans alike. It is becoming increasingly difficult to grow crops due to drought and scarcity of water resources as many crops, such as grain crops, need enormous amounts of water to grow. (Sciama, 2015).

While some regions experience prolonged periods of draught, other regions experience an increase in water resources leading to water stress for plants, hindering its growth.

¹³ Research paper.

¹⁴ <https://www.livescience.com/37057-global-warming-effects.html>

¹⁵ <https://www.nationalgeographic.com/environment/article/global-warming-effects>

IV. health:

Climate change can directly affect human health. Extreme cold waves in temperate regions have become rare, which has led to a decrease in the death rate, but in return the frequency of severe heat waves increased which in return increased the death rate in summer. (Sciama, 2015)

The increase in temperature also creates a suitable environment for the growth of viruses and the spread of diseases.

Future predictions and how to prevent them:

The effects of global warming are expected to increase in severity by the twenty-second century, threatening all forms of life on Earth. Environmental scientists expect that glaciers will continue to melt raising the sea level and endangering the lives of polar species, the increase in ocean temperature will directly affect the marine environments, and the graveness of weather will increase accompanied by intense hurricanes and storms. Thus, we must take firm and fast decisions regarding this phenomenon.¹⁶

Humans are the main cause of global warming. However, they are the ones who hold the key to saving the planet.

Governments around the world are beginning to feel the threat that global warming and climate change can pose to human life and life in general, hence the held meetings and conferences globally to discuss this issue and present solutions to save our planet from this crisis.

These efforts include:

- Replacing fossil fuels with renewable and sustainable energy.
- Setting laws criminalizing the killing of trees and deforestation.
- Creating local and global organizations to help raise awareness among people who are still oblivious to the effects of global warming.
- Establishing strict monitoring system over factories and their disposal of industrial waste to reduce the amount of smog in the atmosphere.
- Conducting research and developing programs to study this phenomenon and find ways to restore destroyed ecosystems.¹⁷

¹⁶ <https://scied.ucar.edu/learning-zone/climate-change-impacts/predictions-future-global-climate>

¹⁷ <https://www.nationalgeographic.com/environment/article/global-warming-solutions>

Doing your part to save the planet is not as complicated as it sounds, in fact the smallest changes in our daily activities are far more than enough. If each of us did the bare minimum, the state of our planet would be exceptionally improved. Every effort, no matter how small, means a lot.

The United Nations has left some recommendations on its official website as a steppingstone to a healthier planet as part of their campaign “Act Now” which focuses on individual action on climate change and sustainability, **and they include**¹⁸:

- Preserving electrical energy in the house.
- Reducing food waste.
- Using environmentally friendly products.
- Reusing and recycling.
- Reconsidering your travels.
- Walking, cycling, or using public transportation.
- Most importantly, Speaking Up.

These are all small steps that we can slowly incorporate into our lives to live in a better environment.

¹⁸ <https://www.un.org/ar/actnow>

Conclusion:

At the end of this research, I have concluded that global warming is the rise in the average temperatures of the atmosphere and oceans around the world, then we presented the most important reasons for the increase in the proportion of greenhouse gases in the atmosphere, and we learned about the effects of global warming on living creatures, and finally we know about ecologists' future predictions of global warming and climate. Then, I presented some solutions to avoid the dangers of these expectations, and I reached the following results:

- Greenhouse gases are the main cause of global warming, as they trap infrared rays and prevent them from leaving the atmosphere into the space.
- The increase in greenhouse gases has many causes, including both natural and human.
- The impact of global warming on the environments which led to the melting of the glacier mass, the tropical regions becoming drier, and the coastal areas and islands being threatened by drowning.
- Global warming has resulted in weather disturbances, which lead to costly damage to human facilities and ecosystems.
- Climate changes have affected agriculture and irrigation due to drought and water scarcity.
- Increased temperatures provided a suitable environment for viruses and diseases to grow and spread, affecting the general health of humans.
- Environmental scientists expect that the problem of global warming and its dangers will increase in severity in the coming years, threatening life on earth.
- the world working together will enable us to avoid the consequences of this phenomenon and limit its spread by making firm decisions and changing our habits.

Recommendations:

- I recommend everyone to read and keep up to date with the latest information on this phenomenon.
- I recommend discussing it with your colleagues, teachers, and family to raise public awareness of global warming.
- I recommend doing your duty towards the environment and its natural resources and making environmentally friendly decisions in your daily life

Future research:

- i. Conducting a survey to measure the extent of people's awareness of global warming and its effects.
- ii. Conducting a study on the correlation between the ozone hole and global warming.
- iii. Conducting a study on the polar regions and their impact on climatic changes.
- iv. Conducting a study on clean energy sources and how to benefit from them.
- v. Conducting a study on species threatened by extinction due to global warming.

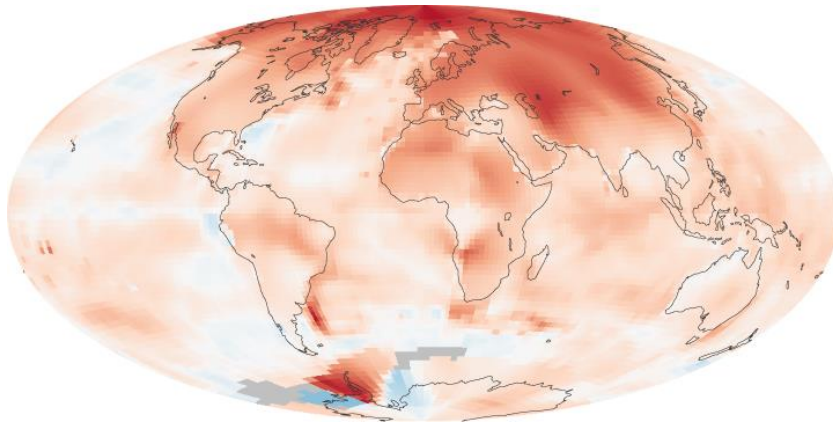
References:

- The Holy Quran.
- Al-Tabari, Muhammad bin Jarir (2010). Jami` al-Bayan on the Interpretation of the Verse of the Qur'an [Volume Eight].
- Sciama, Yeves; Monem, Zainab [Translator] (2015) **Le Changement Climatique (une petite encyclopedia)** Translated version. Riyadh: King Abdulaziz City for Science and Technology.
- Elias, Scott (2021 AD) **Threats to the Arctic**. Amsterdam: Elsevier
- Issa, Hana Fahmy Ahmed (2018 AD). **Islamic Sharia protection of the natural environment**, a comparative jurisprudence study, College of Islamic and Arabic Studies for Girls: Mansoura, Arab Republic of Egypt.
- Media Research and Studies Center, (2019 AD). **Climate change: introducing it and its dangers**, Kuwait.
- Al-Kufi, Hassan Shakir Aziz (2009). **The phenomenon of global warming and its relationship to human activities and natural disasters**, Master's thesis - Faculty of Management and Economics - Department of Environmental Management, Arab Open Academy in Denmark: Copenhagen, Denmark.
- Tadesse, Debay (2010 AD). **The Impact of Climate Change in Africa**, Research Paper, Institute for Security Studies: Pretoria, Southern Africa.
- Wikipedia Encyclopedia: <https://ar.wikipedia.org/>
- The United Nations Campaign **Act Now**: <https://www.un.org/en/actnow>
- UCAR. **Predictions of future global climate**. Accessed: 2/2/2022, at: <https://scied.ucar.edu/learning-zone/climate-change-impacts/predictions-future-global-climate>
- United Nations. (2021 AD). Conference Together for Our Planet [26th Session] COP26. Scotland. Glasgow. Retrieved: 1/1/2021 AD. On the link: <https://www.un.org/ar/climatechange/cop26>
- Schlossberg, Tatiana. (2016). **How bad is your air conditioner for the planet?**. Article in the New York Times. Retrieved: 3/1/2022 AD
- On the link: <https://www.nytimes.com/2016/08/10/science/air-conditioner-global-warming.html>
- National Geographic, (2021). Accessed: 9/1/2022 AD. On the link: <https://www.nationalgeographic.com/environment/article/global-warming-effects>

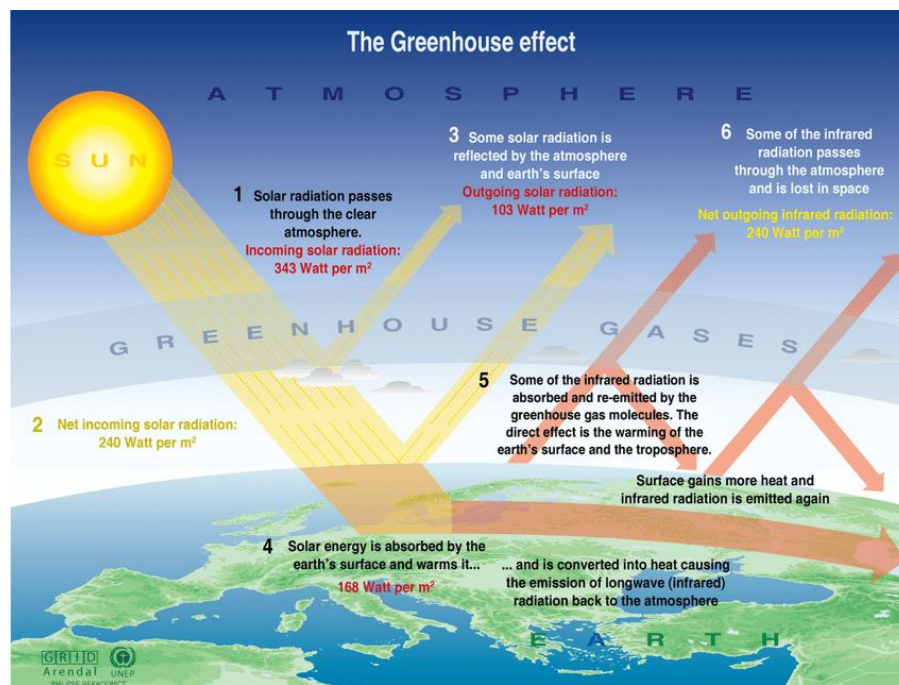
- Al-Juhani, Muharram. (2021). **Water stress threatens Egyptian plants..** and efforts to develop heat-tolerant varieties. Today's News newspaper. Cairo. Retrieved: 3/1/2022 AD. On the link:
<https://m.akhbarelyom.com/news/newdetails/3452657/1>
- Nunez, Christina. (2019). **Global warming solutions, Explained.** National Geographic. Viewed: 1/2/2022 AD. On the link:
<https://www.nationalgeographic.com/environment/article/global-warming-solutions>
- UCAR. **How Volcanoes Influence Climate.** Accessed: 4/1/2022 AD. On the link: <https://scied.ucar.edu/learning-zone/how-climate-works/how-volcanoes-influence-climate>
- Bradford, Elena. Pappas, Stephanie. (2021). **What are the effects of Global Warming?** Accessed: December 29, 2021AD. On the link:
<https://www.livescience.com/37057-global-warming-effects.html>

Picture, diagrams, and maps:

A map showing the increase of temperatures globally:

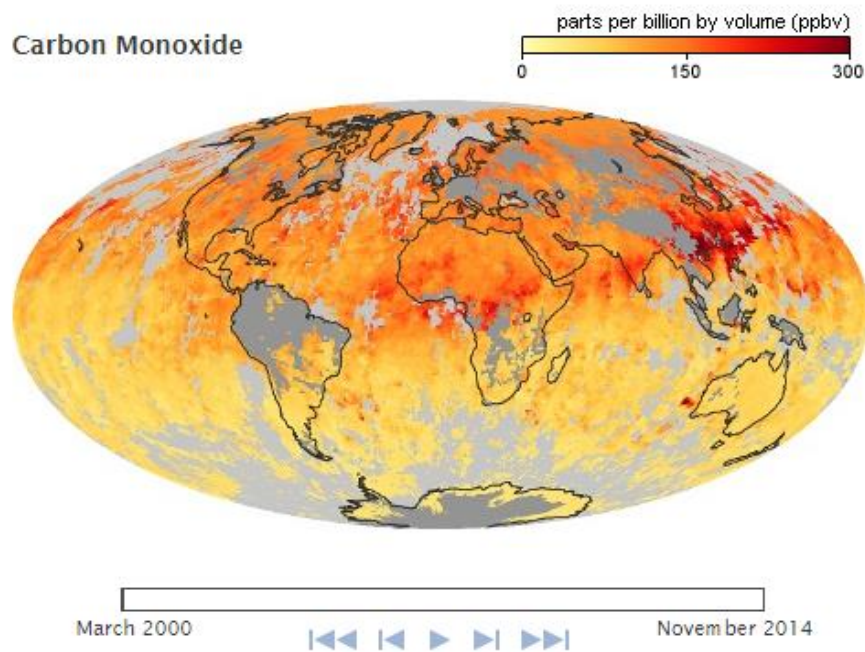


Greenhouse effect:

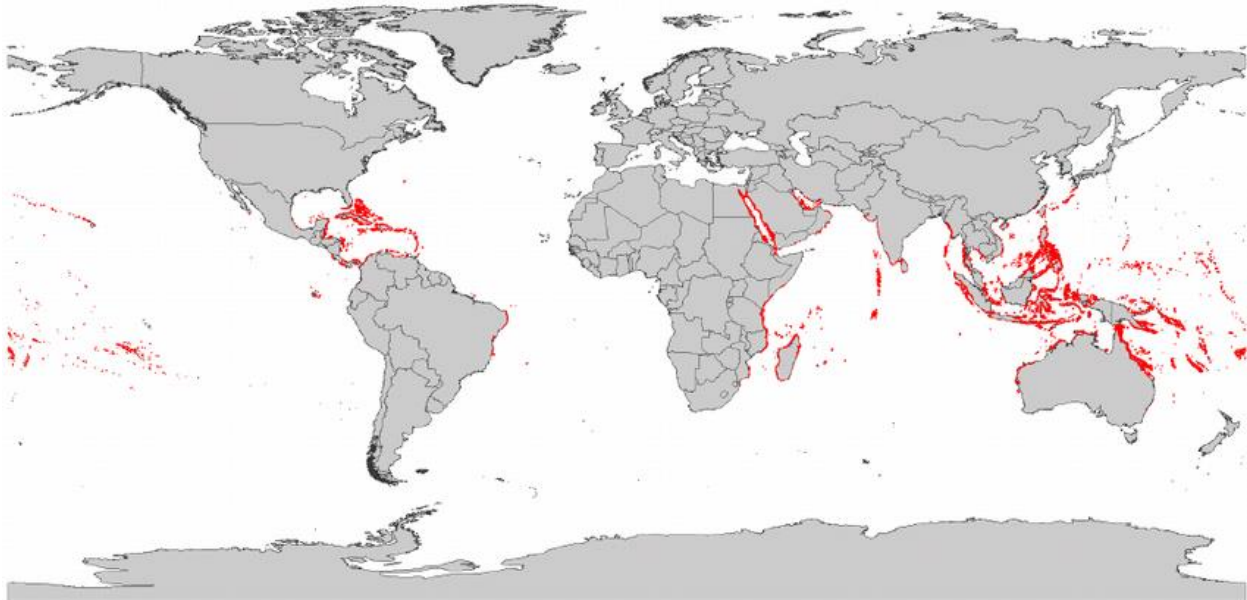


Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996.

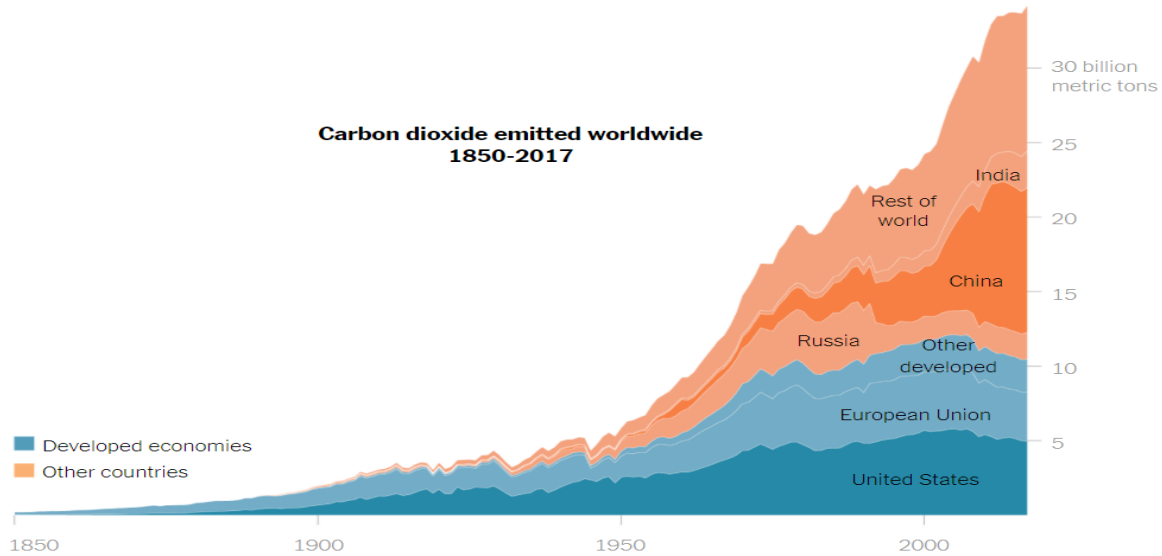
Map showing the increase in CO from March 2000 to November 2014:



A map showing the endangered coastal regions:



A diagram showing CO2 emissions globally:



The loss in human facilities resulting from the collapse of the land due to heavy rain in California, USA:



Polar bears have lost their food resources and habitats due to the melting of glaciers:



Australian forest fires:



The flooding of a city after the rise in sea levels:



Glaciers between the past and present:

