<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Global Aerosol Optical Depth and PM2.5 Concentration (2000-2024)</title>

<script src="https://cdn.plot.ly/plotly-latest.min.js"></script>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Global Aerosol Optical Depth and PM2.5 Concentration (2000-2024)</title>

<script src="https://cdn.plot.ly/plotly-latest.min.js"></script>

<header class="header">

<!-- Your header content -->

</header>

<title>Climate Change Awareness</title>

</h1>

<!-- Styles -->

<style>

h1 {

font-size: 40px;

}

h2 {

font-size: 40px;

}

#chartdiv {

width: 100%;

height: 500px;

}

</style>

<!-- Resources -->

<script src="https://cdn.amcharts.com/lib/4/core.js"></script>

<script src="https://cdn.amcharts.com/lib/4/charts.js"></script>

<script src="https://cdn.amcharts.com/lib/4/themes/animated.js"></script>

<!-- Chart code -->

<script>

am4core.ready(function() {

// Themes begin

am4core.useTheme(am4themes\_animated);

// Themes end

var chart = am4core.create("chartdiv", am4charts.PieChart3D);

chart.hiddenState.properties.opacity = 0; // this creates initial fade-in

chart.legend = new am4charts.Legend();

chart.data = [

{

country: "Energy Production",

litres: 73

},

{

country: "Transportation",

litres: 16

},

{

country: "Industry",

litres: 8

},

{

country: "Agriculture",

litres: 10

},

{

country: "Residential and Commercial Buildings",

litres: 6

},

{

country: "Waste Management",

litres: 3

},

{

country: "Land Use and Forestry",

litres: 10

},

];

var series = chart.series.push(new am4charts.PieSeries3D());

series.dataFields.value = "litres";

series.dataFields.category = "country";

}); // end am4core.ready()

</script>

<style>

p {

font-size: 30px;

}

.stil-butonu {

background-color: #ccc; /\* Buton arka plan rengi \*/

color: black; /\* Yazı rengi \*/

padding: 15px 32px; /\* Buton iç boşlukları \*/

font-size: 16px; /\* Yazı boyutu \*/

border: none; /\* Kenar çizgisi yok \*/

border-radius: 12px; /\* Köşeleri yuvarlak \*/

cursor: pointer; /\* Üzerine gelince imleç değişir \*/

transition: background-color 0.3s ease; /\* Geçiş efekti \*/

}

.stil-butonu:hover {

background-color: #45a049; /\* Üzerine gelince arka plan rengi \*/

}

body {

background-color:white;

color: black;

}

h1 {

background: linear-gradient(to left,#1c0f45,black);

color: white;

text-align: center

font-family: Arial, sans-serif;

height: 70px

}

h2 {

background-color:#1c0f45;

color: #8C92AC;

text-align: center

font-family:Calibri, fantasy;

}

}

.button {

background-color: #ccc;

color: black;

border: 2px solid white;

padding: 10px 20px;

text-align: center;

text-decoration: none;

display: inline-block;

margin: 10px 0;

cursor: pointer;

}

.btn1{

background-color: #fff;

color:black;

border: 2px solid white;

color:#C8A2C8;

text-decoration: none;

}

.btn1:hover{

opacity:0.7;

}

.header {

height: 300px;

background-image: url('cosmıta.jpg');

background-size: cover; /\* Adjust the image size to cover the header \*/

background-position: center; /\* Center the image \*/

/\* Additional properties for background if needed \*/

}

.graphic {

width: 100%;

height: auto;

border: 2px solid white;

}

</style>

<meta charset="UTF-8" />

<meta

name="viewport"

content="width=device-width, initial-scale=1.0"

/>

<title>Pie Chart</title>

<style>

.piechart {

width: 200px;

height: 200px;

border-radius: 50%;

background-image: conic-gradient(

pink 70deg,

lightblue 0 235deg,

orange 0

);

}

</style>

<script src="mapdata.js"></script>

<script src="continentmap.js"></script>

<meta charset="UTF-8">

</head>

<body>

<h1 style="font-size:300%;">COSMITA</h1>

<h1>Climate Change Awareness</h1>

<div class="container">

<i class="fas fa-bars" id="menu"></i>

</label>

<div class="sidebarmenu">

<table>

<tr>

<td>

<a href="#bolum1"><button class="stil-butonu">BÖLÜM 1</button></a>

</td>

<td>

<a href="#bolum2"><button class="stil-butonu">BÖLÜM 2</button></a>

</td>

<td>

<a href="bolum3"><button class="stil-butonu">BÖLÜM 3</button></a>

</td>

<td>

<a href="bolum4"><button class="stil-butonu">BÖLÜM 4</button></a>

</td>

</tr>

</table>

<ul>

</div>

</div>

<a href="https://www.nasa.gov/"

class="btn btn1">NASA</a></p>

<img src="AnkaraFenLisesi-logo.png" border="0" width="72" height="90" alt="">

<br>

<section>

<a href="https://climate.nasa.gov/vital-signs/carbon-dioxide/?intent=121#:~:text=Carbon%20dioxide%20(CO2)%20is,natural%20processes%20like%20volcanic%20eruptions.">carbon dioxide</a> (<p>

Imagine stepping outside and feeling the warmth of the sun on your skin, but what if that warmth transforms into a sweltering heatwave? Climate, often mistaken for just the weather we experience day to day, refers to the long-term patterns and averages of temperature, humidity, and other atmospheric conditions in a given region. So, why does this matter? Because these shifting patterns are telling us a story about our planet’s health—one that involves melting glaciers, rising sea levels, and more intense storms. Have you ever wondered how a tiny change in temperature could lead to an entire ecosystem unraveling? As we dive deeper into this intricate web of interactions, it becomes clear: the climate isn’t just a backdrop; it’s a dynamic player in our lives, shaping everything from the food we eat to the air we breathe. What role will you play in this unfolding narrative? We will answer all of your quiestions about climate changing by interactive maps and graphics.

<br>

<br>

Climate change is all about the long-term shifts in our planet’s climate, and guess what? Most of it is driven by us! The increase in greenhouse gases (like carbon dioxide and methane) is a major factor, acting like a thick blanket that traps heat in the atmosphere. This surge in gases comes from burning fossil fuels, chopping down forests, and farming practices that release more emissions than we might realize. Think about it: when we cut down trees, we lose nature’s built-in CO₂ absorbers, and certain farming methods contribute to a hefty dose of methane. Industrial activities and urban growth add fuel to the fire, leading to rising sea levels and crazy weather patterns. So, as we ponder these reasons, it raises an important question: how can we all play a part in reversing these changes and create a more sustainable future? Every little action counts!

<br>

<br>

We aim to explain climate change to you on this website by enriching it with interactive maps and graphics, more interestingly and differently than other sites, and to keep our content in the minds of those who read it. It is the duty of every human being to protect our future, our own world. I hope we were able to raise this awareness in you.

<br>

<br>

<br>

<br>

Climate change is driven by a combination of natural processes and human activities. Natural reasons include volcanic eruptions, which can release large amounts of ash and gases into the atmosphere, temporarily cooling the Earth, and variations in solar radiation, which can alter climate patterns over long periods. Additionally, natural phenomena like El Niño and La Niña cycles influence weather patterns and ocean temperatures, contributing to climate variability. On the other hand, human-induced factors are significant contributors to climate change. The burning of fossil fuels for energy releases greenhouse gases, primarily carbon dioxide and methane, into the atmosphere. Deforestation reduces the planet’s capacity to absorb CO₂, while industrial processes and agricultural practices emit various pollutants. Urbanization and land-use changes further exacerbate these issues by altering natural landscapes. Together, these natural and anthropogenic reasons create a complex interplay that drives the ongoing changes in our climate, highlighting the urgent need for comprehensive solutions.

<br>

<br>

<br>

<h1 id="bolum1"> Natural Reasons of Climate Changing</h1>

<br>

<br>

<h2>Effects of sunlight on climate change</h2>

<br>

<p>Solar radiation plays a vital role in climate change through various complex processes. The sun is Earth's primary energy source, influencing climate systems significantly. Solar effects on climate can be direct or indirect. Solar activity, such as sunspots and magnetic storms, can alter the energy reaching Earth, impacting climate over centuries. The interaction of sun rays with Earth's atmosphere affects climate through albedo feedback - where changes in reflection due to melting snow and ice contribute to warming. The greenhouse effect, caused by atmospheric absorption of solar energy, leads to global warming by trapping heat. Sunlight interacting with atmospheric aerosols can either cool or warm regions. Natural processes like solar cycles combine with human activities, such as greenhouse gas emissions, to accelerate climate change, creating dramatic impacts.

</p>

<h2>The Effects of Orbit Changes on Climate Change </h2>

<br>

<p>On time scales of tens of thousands of years, the dominant radiative forcing of the Earth's climate is associated with slow changes in the geometry of the Earth's orbit around the Sun. These changes include the shifting of the equinoxes (i.e., changes in the timing of summer and winter), which occur on a time scale of approximately 26,000 years; changes in the angle of inclination of the Earth's axis of rotation relative to the plane of the Earth's orbit around the Sun, occurring on a time scale of approximately 41,000 years; and changes in the eccentricity (deviation from a perfect circle) of the Earth's orbit around the Sun, occurring on a time scale of approximately 100,000 years. Changes in eccentricity slightly affect the average annual solar radiation at the top of the Earth's atmosphere, but the primary impact of all orbital changes listed above is on the seasonal and latitudinal distribution of solar radiation incident on the Earth's surface. The major ice ages of the Pleistocene Epoch were closely related to the impact of these changes on summer solar radiation at high northern latitudes. Orbital variations thus exerted a primary control on the extent of continental ice sheets. However, Earth's orbital changes are generally believed to have had little impact on climate over the last few thousand years, and so they are not considered important factors in present-day climate variability. </p>

<br>

<h2>Effects of Atmospheric Compounds on Climate Change </h2>

<br>

<p>Atmospheric compounds have a significant impact on climate change by altering Earth's energy balance. These compounds are categorized into greenhouse gases, aerosols, and other gases. Greenhouse gases, like Carbon Dioxide and Methane, trap heat in the atmosphere, leading to the greenhouse effect. Aerosols can have a cooling or warming effect by reflecting sunlight or absorbing heat. Water vapor, the most abundant greenhouse gas, acts as a feedback mechanism, amplifying the greenhouse effect. Ozone in the stratosphere protects the Earth from UV radiation, while tropospheric ozone contributes to warming and air quality degradation. Other gases, like hydroxyl radicals, play a role in influencing greenhouse gas concentrations. Overall, greenhouse gases are the main drivers of warming, with aerosols sometimes offsetting their effects. Understanding and controlling atmospheric compounds are crucial for addressing climate change.</p>

<br>

<h2>The Effects of Albedo Properties on Climate Change </h2>

<br>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Global Aerosol Optical Depth and PM2.5 Concentration (2000-2024)</title>

<script src="https://cdn.plot.ly/plotly-latest.min.js"></script>

<h2>Global Aerosol Optical Depth and PM2.5 Concentration (2000-2024)</h2>

<div id="chart" style="width: 100%; height: 600px;"></div>

<script>

// Yıllar

var years = ['2000', '2001', '2002', '2003', '2004', '2005', '2006', '2007', '2008', '2009',

'2010', '2011', '2012', '2013', '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022', '2023', '2024'];

// Aerosol Optik Derinliği verileri

var aerosolOpticalDepth = [0.10, 0.11, 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19,

0.20, 0.21, 0.22, 0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.30, 0.31, 0.32, 0.33, 0.34];

// PM2.5 Konsantrasyonu verileri

var pm25Concentration = [35, 34, 32, 30, 28, 26, 24, 25, 22, 20,

18, 17, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3];

// Grafik verileri

var trace1 = {

x: years,

y: aerosolOpticalDepth,

name: 'Aerosol Optical Depth',

type: 'bar',

marker: {

color: 'purple'

}

};

var trace2 = {

x: years,

y: pm25Concentration,

name: 'PM2.5 Concentration (µg/m³)',

type: 'bar',

marker: {

color: 'orange'

}

};

var data = [trace1, trace2];

// Düzen ayarları

var layout = {

title: 'Global Aerosol Optical Depth and PM2.5 Concentration (2000-2024)',

barmode: 'overlay',

xaxis: {

title: 'Years'

},

yaxis: {

title: 'Values'

}

};

// Grafiği oluşturma

Plotly.newPlot('chart', data, layout);

</script>

<br>

<p>The atmosphere's albedo properties impact climate change by determining how much sunlight each surface reflects. Albedo ranges from 0 to 1, where 0 means no reflection and 1 means total reflection. Melting ice and snow result in lower albedo, leading to increased sunlight absorption and higher temperatures, known as "albedo feedback. " Changes in forest cover also affect albedo, with decreased albedo causing more absorption of sunlight. Atmospheric aerosols and cloud properties further influence albedo, creating complex effects on temperature regulation. Feedback loops exacerbate climate change through processes like glacial melting and altered albedo. Rising global temperatures can disrupt albedo patterns, hastening climate change.</p>

<br>

<h2>The Effects of Volcanic Erruptions on Climate Change </h2>

<br>

<p>Volcanic eruptions can impact climate by emitting ash and gases that cool the Earth's surface, as sulfate aerosols reflect sunlight. These aerosols can linger in the atmosphere for 1-3 years, causing global temperature fluctuations. Large eruptions can lead to overall cooling of the air, releasing sulfur dioxide and minor amounts of carbon dioxide, temporarily increasing CO₂ levels. Water vapor and methane are also released, indirectly affecting climate. This can cause changes in weather patterns, atmospheric circulation, and even mass extinctions. Understanding volcanic impact on climate is crucial for assessing natural climate variations and human-induced changes as it influences the carbon cycle and long-term carbon storage in geological formations.</p>

<br>

<h2>The Effect of Cloud Cover on Climate Change </h2>

<p>Cloud cover plays a complex role in climate change due to its dual effect on Earth's energy balance. Depending on type and altitude, clouds can either cool or warm the surface. Low clouds, like marine stratus clouds, have a high albedo, reflecting solar radiation back into space and cooling the Earth. Conversely, high clouds, like cumulus clouds in the upper troposphere, trap infrared radiation, leading to surface warming. This balance between cooling and warming effects contributes to the uncertainty surrounding clouds' role in future climate predictions.

<br>

<h1 id="bolum2"> 2.The Effects Of Human Activities on Climate Change </h1>

<br>

<p>Although natural causes theoretically affect climate change, human-induced activities have a great impact on global climate change. Human-induced factors such as industrial activities, agricultural practices and fossil fuel use accelerate changes in climate. Human activities greatly increase carbon dioxide, methane, carbon monoxide and other gases in the atmosphere, oceans and terrestrial regions.

<br>

<br>

1.Industrilization

<br>

Since the industrial revolution, human migration to urban areas has led to population growth and an increase in agricultural and industrial practices that pump greenhouse gases into the atmosphere. This has also caused deforestation due to land use for agriculture and urban areas, as well as an increase in fossil fuel burning for energy needs. Industrialization involves significant economic and social changes, such as urbanization, increased wage earners, and advanced education. It focuses on manufacturing and technological innovations to improve food production, infrastructure, resource conservation, transportation, and energy efficiency. Greenhouse gases, including CO2, N2O, CH4, and others, are the main drivers of observable climate change since the mid-20th century. Carbon dioxide, although not the most potent, is significant due to its radiative forcing impact on the earth's energy balance and global temperature.

<br>

<br>

2. Fossil Wastes

<br>

Fossil fuel waste from human activities like industry and transportation significantly impacts climate change by releasing toxic pollutants into the air, land, and oceans, leading to global pollution and ecosystem degradation. Land degradation results from oil, gas, and coal extraction, harming landscapes and ecosystems through infrastructure development. Coal mining contaminates water sources, while oil spills threaten freshwater and ocean ecosystems. Processes like fracking produce wastewater with heavy metals and pollutants that can contaminate drinking water. Fossil fuel emissions, including carbon dioxide, contribute to climate change, with the U. S. power and transportation sectors being major carbon emitters. Additionally, coal-fired power plants release mercury, sulfur dioxide, and soot, leading to acid rain and air pollution. Fossil fuel vehicles emit carbon monoxide and nitrogen oxide, contributing to smog and respiratory illnesses with prolonged exposure. Ultimately, burning fossil fuels not only meets energy needs but exacerbates the current global warming crisis, highlighting the urgent need for sustainable energy solutions.

<br>

<br>

3. Deforestration

<br>

Deforestation is one of the main contributory factors to climate change as a result of disrupted carbon processes or increased greenhouse gases emissions. Forests play a very important role in taking carbon dioxide out of the atmosphere, which then gets stored as biomass. Every time a forest is burned or cut down, that type of stored carbon is released into the atmosphere in the form of carbon dioxide-the most potent of all greenhouse gases responsible for global warming. This, in turn, contributes to increasing the levels of carbon in the atmosphere while simultaneously reducing the rate at which forests can absorb future emissions, thus hastening climate change.

Also, deforestation influences albedo-the reflectance of Earth's surface-which, on the other hand, is able to affect climate. Deforestation for agriculture replaces the forests with farmland, which increases albedo and reflects more solar radiation, thereby cooling the surface. This effect can be complex and dependent on region and season; tropical deforestation often results in net warming because of reduced evapotranspiration.

Other environmental effects of deforestation are a loss of biodiversity, soil erosion, and disruption of the water cycle, besides climate change. Forests are a home to a great part of the world's biodiversity; therefore, its destruction can lead to the extinction of various species. The removal of trees also has the effect of destabilizing the soil, thus making it more liable to landslides, besides affecting the quality of water because of increased runoff and erosion.

<br>

<br>

4. Agrarian Activities

<br>

The effects of climate change on agricultural activities are pretty apparent. Due to the water crisis, infertility of the soil, and extreme temperatures, performance becomes more complicated year after year. Agricultural activities have also many negative impacts on climate. Agriculture has a high share of 20% among the factors causing the increase of greenhouse gases in the world. While the use and production of energy, fertilization, and application of pesticides increase the emissions of carbon dioxide, methane, and nitrous oxide gases, it can be considered among the causes of the climate crisis that growing plants that require more water in areas where rainfall is low or applying unconscious irrigation methods increases the water footprint.

<br>

<h1 id="bolum3"> Our future climate and its possible impacts </h1>

<br>

<p>Current evidence suggests that our planet is experiencing a significant warming trend. Some key indicators include the breaking of temperature records in 1990, 1995, and 1997, a rise in global mean sea level by 10-20 cm, a 10-15% reduction in sea ice extent in the Northern Hemisphere, and a 40% decrease in Arctic Ocean ice thickness during late summer to early autumn. There has also been an observable retreat of mountain glaciers and an increase in extreme weather events like droughts, tropical cyclones, and floods globally over the past few decades.

<br>

<p>Future projections based on complex models anticipate a global average surface temperature increase of 1. 4-5. 8°C by 2100, a sea level rise of 9-88 cm, intensified precipitation, and more severe El Niño events. Snow cover, sea ice, and glaciers are expected to continue decreasing, impacting areas like Mount Kilimanjaro. Climate change will affect human health, potentially leading to an increase in diseases, threats to vulnerable species, and an increase in coral mortality. Even if greenhouse gas emissions were ceased today, concerns about human-induced climate change would persist for centuries due to the longevity of gases like carbon dioxide. Technologies to combat global warming are being explored, with renewable energy sources emerging as the most promising option to reduce carbon dioxide emissions. Adapting to changing climate conditions and respecting the environment for future generations are key aspects of addressing climate change

<br>

<h3>Distribution of Factors Causing Greenhouse Gas Emissions</h3>

</div>

<div id="chartdiv"></div>

<h1 id="bolum4"> Possible Solutions For Climate Change</h1>

<br>

<p>1.Shifting to renewable energy sources such as solar and wind power is crucial in combating climate change by reducing CO2 emissions.

<br>

2.Improving energy efficiency in buildings and transportation through better construction standards and electric vehicles helps lower energy demand and emissions.

<br>

3.Implementing carbon pricing mechanisms like carbon taxes or cap-and-trade can incentivize cleaner options and reduce greenhouse gas emissions.

<br>

4.Preserving forests and promoting reforestation can help absorb CO2 and combat deforestation.

<br>

5.Sustainable agriculture practices and land-use planning can reduce emissions and protect biodiversity.

<br>

6.Adopting circular economic models and reducing waste through reuse and recycling can lower emissions.

<br>

7.Carbon capture and storage technology is important for capturing CO2 emissions from industrial processes.

<br>

8.Changing societal values and behaviors can promote sustainability and reduce emissions.

<br>

9.Global cooperation and international agreements are essential in addressing climate change.

<br>

10.Building resilience and adaptation strategies can help communities mitigate the impacts of climate change on human life and livelihood.

<br>

<div>

<div id="map"></div>

</div>

</body>

</html>