

## Chapter 1 : Effects of global warming - Wikipedia

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Fellow Science Global warming is happening now. The trend is clear and unmistakable. Every one of the past 40 years has been warmer than the 20th century average. The 12 warmest years on record have all occurred since Globally, the average surface temperature has increased more than one degree Fahrenheit since the late s. Most of that increase has occurred over just the past three decades. We are the cause. Where does all this carbon come from? The fossil fuels we burn for energy—coal, natural gas, and oil—plus the loss of forests due to deforestation, especially in the tropics. The scientific evidence is clear. Within the scientific community, there is no debate. An overwhelming majority of climate scientists agree that global warming is happening and that human activity is the primary cause. East Coast and Gulf of Mexico. More Frequent and Intense Heat Waves Dangerously hot weather is already occurring more frequently than it did 60 years ago. Costly and Growing Health Impacts Climate change has significant implications for our health, including increased air pollution and a longer and more intense allergy season. As individuals, we can help by taking action to reduce our personal carbon emissions. But to fully address the threat of global warming, we must demand action from our elected leaders. Reducing tropical deforestation can significantly lower global warming emissions and plays an integral role in a comprehensive long-term solution to global warming. Media pundits, partisan think tanks, and special interest groups raise doubts about the truth of global warming. This barrage of misinformation misleads and confuses the public—and makes it more difficult to implement effective solutions. Even as we work to reduce global warming emissions, we must also prepare for this dangerous new reality.

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*The planet is warming, from North Pole to South Pole. Since , the global average surface temperature has increased between and degrees Fahrenheit ( to degrees Celsius)-even.*

Forest Service Tens of millions of trees have died in the Rocky Mountains over the past 15 years, victims of a climate-driven triple assault of tree-killing insects, wildfires, and stress from heat and drought. Costly and growing health impacts Photo: Rising temperatures will likely lead to increased air pollution , a longer and more intense allergy season , the spread of insect-borne diseases , more frequent and dangerous heat waves , and heavier rainstorms and flooding. All of these changes pose serious, and costly, risks to public health. An increase in extreme weather events Photo: Global warming also creates conditions that can lead to more powerful hurricanes. Heavier precipitation and flooding Photo: Very heavy precipitation events, defined as the heaviest one percent of storms, now drop 67 percent more precipitation in the Northeast, 31 percent more in the Midwest and 15 percent more in the Great Plains than they did 50 years ago. More severe droughts in some areas Photo: As temperatures have warmed, the prevalence and duration of drought has increased in the western U. Increased pressure on groundwater supplies Photo: The resulting dry conditions will increase the pressure on groundwater supplies as more is pumped to meet demand even as less precipitation falls to replenish it. Growing risks to our electricity supply Photo: Reservoirs fill too early and water needs to be released for flood control. Vegetation and soils dry out earlier, setting the stage for longer and more damaging wildfire seasons. Scientists expect the rate of melting to accelerate, with serious implications for future sea level rise. Disruptions to food supplies Photo: Global warming has the potential to seriously disrupt our food supply, drive costs upward, and affect everything from coffee to cattle , from staple food crops to the garden in your backyard. Destruction of coral reefs Photo: NOAA As global temperatures rise, so too do average sea surface temperatures. These elevated temperatures cause long-term damage to coral reefs. Scientists have documented that sustained water temperatures of as little as one degree Celsius above normal summer maxima can cause irreversible damage. Plant and animal range shifts Photo: The range of some warm-weather species will expand, while those that depend on cooler environments will face shrinking habitats and potential extinction. Even though it is unlikely to occur in the near future, global warming may increase the risk of such events. One of the most significant potential mechanisms is a shift in an ocean circulation pattern known as thermohaline circulation, which would have widespread consequences for Europe and the U. We Need Your Support to Make Change Happen We can reduce global warming emissions and ensure communities have the resources they need to withstand the effects of climate change—but not without you. Your generous support helps develop science-based solutions for a healthy, safe, and sustainable future.

**Chapter 3 : Global Warming | Union of Concerned Scientists**

*Learn about global warming and the consequences to our environment from increased wildlife extinction rates to acidic oceans and polluted air.*

This will be challenging, but not impossible. IPCC The world is already feeling the impacts of global warming. Since before the Industrial Revolution, the global thermostat has climbed by about 1 degree Celsius. As a result, hurricanes are becoming more fierce; the seas are rising as ice sheets melt; droughts and extreme precipitation events are becoming more common. A special report published this week finds that things will get a lot worse if we let the planet reach 2 degrees of warming. The difference between 1. Limiting climate change to 1. According to the report: Global sea level rise would be reduced by about 10 centimeters by Slowing sea level rise can lessen the impacts of hurricanes, and give people living on islands and coastlines more time to adapt. Fewer species would go extinct, and ecosystems would retain more of their services to humans, such as providing food and water. Some coral reefs would survive, instead of being nearly or completely wiped out. The risks of droughts, food shortages, floods, heat-related deaths are lower under 1. But limiting warming to 1. This demands dramatic and rapid changes in how we live. Vijay Modi, a professor of mechanical engineering at Columbia University, agreed. A price on carbon, perhaps in the form of a carbon tax, would make it more expensive to burn fossil fuels and release the emissions into the atmosphere. Not only would this encourage businesses and consumers to change their ways, but it make low-carbon products more competitive, thus increasing investment in those areas. And carbon pricing could have a minimal effect on the economy, particularly if the tax revenues are used in productive ways like to lower other taxes, such as the payroll tax. Modi sees the glass as "more than half" full, highlighting the potential for solar power and both onshore and offshore wind power in the Northeast. In New York City, heating is the biggest source of climate-causing emissions, accounting for more than 50 percent. The IPCC report notes that limiting warming to 1. Kaufman notes that the government could do more to support low carbon infrastructure and innovation of low carbon technologies like carbon removal. Greater investment in research and development could help to "take the good ideas that already exist today and bring them to the commercialization phase," he says. This is indeed a daunting challenge, but the momentum for change is already growing. It comes from voters demanding climate action. It comes from cities and states taking matters into their own hands. It comes from businesses who know a smart investment when they see one, and from individuals who help to cultivate a climate-conscious culture. Just as tackling climate change requires a multitude of technologies, it requires action at all levels of society. Earth Institute, Columbia University 28 shares.

**Chapter 4 : Global Locations & Contact Info | POSSIBLE**

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Attribution of recent climate change In this article, " climate change " means a change in climate that persists over a sustained period of time. Changes in climate may be due to natural causes, e. Detection does not imply attribution of the detected change to a particular cause. NASA GISS The graph above shows the average of a set of temperature simulations for the 20th century black line , followed by projected temperatures for the 21st century based on three greenhouse gas emissions scenarios colored lines. This projection is relative to global temperatures at the end of the 20th century. Global surface temperature for the past 5. The last , years are expanded in the lower half of the figure image credit: Physical impacts of climate change Seven of these indicators would be expected to increase in a warming world and observations show that they are, in fact, increasing. Three would be expected to decrease and they are, in fact, decreasing. Each of the different colored lines in each panel represents an independently analyzed set of data. The data come from many different technologies including weather stations , satellites , weather balloons , ships and buoys. Some of the graphs show a positive trend , e. Other graphs show a negative trend, e. Evidence of warming is also apparent in living biological systems. With medium confidence see footnote 1 , IPCC [58] concluded that human influences had contributed to an increase in heavy precipitation events at the global scale. Projections of future changes in precipitation show overall increases in the global average, but with substantial shifts in where and how precipitation falls. Extremely hot nights have doubled in frequency. The area in which extremely hot summers are observed, has increased fold. These changes are not explained by natural variability, and attributed by climate scientists to the influence of anthropogenic climate change. Heat waves with high humidity pose a big risk to human health while heat waves with low humidity lead to dry conditions that increase wildfires. The mortality from extreme heat is larger than the mortality from hurricanes, lightning, tornadoes, floods, and earthquakes together [65] See also heat wave. Tropical cyclones At the global scale, the frequency of tropical cyclones will probably decrease or be unchanged. Some impacts will be beneficialâ€”e. Retreat of glaciers since A map of the change in thickness of mountain glaciers since Thinning in orange and red, thickening in blue. A map that shows ice concentration on 16 September , along with the extent of the previous record low yellow line and the mid-September median extent black line setting a new record low that was 18 percent smaller than the previous record and nearly 50 percent smaller than the long-term â€” average. The cryosphere is made up of areas of the Earth which are covered by snow or ice. Assuming high growth in greenhouse gas emissions SRES A2 , some models projected that Arctic sea ice in the summer could largely disappear by the end of the 21st century. Effects of global warming on oceans The role of the oceans in global warming is complex. The oceans serve as a sink for carbon dioxide, taking up much that would otherwise remain in the atmosphere, but increased levels of CO 2 have led to ocean acidification. Furthermore, as the temperature of the oceans increases, they become less able to absorb excess CO 2. The ocean have also acted as a sink in absorbing extra heat from the atmosphere. Ongoing effects include rising sea levels due to thermal expansion and melting of glaciers and ice sheets, and warming of the ocean surface, leading to increased temperature stratification. Other possible effects include large-scale changes in ocean circulation. Ocean acidification This map shows changes in the amount of aragonite dissolved in ocean surface waters between the s and the most recent decade â€” The uptake of human carbon emissions since the year has led to an average decrease in pH of 0. The effects of ocean acidification on the marine biosphere have yet to be documented. Oxygen depletion The amount of oxygen dissolved in the oceans may decline, with adverse consequences for ocean life. Future sea level Trends in global average absolute sea level, â€” Between and , the rate increased above the previous period to 3. Authors of IPCC AR4 SYR [24] were uncertain whether the increase in rate from to was due to natural variations in sea level over the time period, or whether it reflected an increase in the underlying long-term trend. There are two main factors that have contributed to observed sea level rise. The major store of water on land is found in glaciers and ice sheets. Cited studies suggested a

great deal of uncertainty in projections. There is variability both year-to-year and over longer time scales, with global ocean heat content observations showing high rates of warming for 1993–2008, but some cooling from 2008 to 2012. Regional effects of global warming Temperatures across the world in the 1950s and the 2000s, as compared to average temperatures from 1951 to 2000. Some are the result of a generalised global change, such as rising temperature, resulting in local effects, such as melting ice. In other cases, a change may be related to a change in a particular ocean current or weather system. In such cases, the regional effect may be disproportionate and will not necessarily follow the global trend. There are three major ways in which global warming will make changes to regional climate: The coast can also be considered a region, and will suffer severe impacts from sea level rise. The Arctic, Africa, small islands and Asian megadeltas are regions that are likely to be especially affected by climate change. Climate change and gender The impacts of climate change can be thought of in terms of sensitivity and vulnerability. Sectors sensitive to climate change include water resources, coastal zones, human settlements, and human health. Industries sensitive to climate change include agriculture, fisheries, forestry, energy, construction, insurance, financial services, tourism, and recreation. Food security, Food vs fuel, and 2008 world food price crisis Graph of net crop production worldwide and in selected tropical countries. Raw data from the United Nations. This graph is based on several studies. With medium confidence, global production potential was projected to: Most of the studies on global agriculture assessed by Schneider et al. Studies had also not considered the development of specific practices or technologies to aid adaptation to climate change. Food security Easterling et al. It was noted that these projections were highly uncertain and had limitations. However, the assessed studies suggested a number of fairly robust findings. The first was that climate change would likely increase the number of people at risk of hunger compared with reference scenarios with no climate change. Climate change impacts depended strongly on projected future social and economic development. Additionally, the magnitude of climate change impacts was projected to be smaller compared to the impact of social and economic development. In 2007, the global estimate for the number of people undernourished was 850 million. By contrast, the SRES A2 scenario showed only a small decrease in the risk of hunger from 2000 levels. The smaller reduction under A2 was attributed to the higher projected future population level in this scenario. Droughts and agriculture Some evidence suggests that droughts have been occurring more frequently because of global warming and they are expected to become more frequent and intense in Africa, southern Europe, the Middle East, most of the Americas, Australia, and Southeast Asia. Effects of global warming on human health Human beings are exposed to climate change through changing weather patterns temperature, precipitation, sea-level rise and more frequent extreme events and indirectly through changes in water, air and food quality and changes in ecosystems, agriculture, industry and settlements and the economy Confalonieri et al.

**Chapter 5 : Global Warming Impacts | Union of Concerned Scientists**

*Boosting energy efficiency: The energy used to power, heat, and cool our homes, businesses, and industries is the single largest contributor to global warming. Energy efficiency technologies allow us to use less energy to get the same—or higher—level of production, service, and comfort.*

**Solutions to Global Warming** There is no single solution to global warming, which is primarily a problem of too much heat-trapping carbon dioxide CO<sub>2</sub>, methane and nitrous oxide in the atmosphere. Learn more about the causes of global warming. The technologies and approaches outlined below are all needed to bring down the emissions of these gases by at least 80 percent by mid-century. To see how they are best deployed in each region of the world, use the menu at left. The energy used to power, heat, and cool our homes, businesses, and industries is the single largest contributor to global warming. Energy efficiency technologies allow us to use less energy to get the same—or higher—level of production, service, and comfort. This approach has vast potential to save both energy and money, and can be deployed quickly. A variety of solutions are at hand, including improving efficiency miles per gallon in all modes of transport, switching to low-carbon fuels, and reducing vehicle miles traveled through smart growth and more efficient mass transportation systems. Renewable energy sources such as solar, wind, geothermal and bioenergy are available around the world. Multiple studies have shown that renewable energy has the technical potential to meet the vast majority of our energy needs. Renewable technologies can be deployed quickly, are increasingly cost-effective, and create jobs while reducing pollution. **Phasing out fossil fuel electricity:** Dramatically reducing our use of fossil fuels—especially carbon-intensive coal—is essential to tackle climate change. There are many ways to begin this process. Key action steps include: While it may sound like science fiction, the technology exists to store carbon emissions underground. The technology has not been deployed on a large scale or proven to be safe and permanent, but it has been demonstrated in other contexts such as oil and natural gas recovery. Demonstration projects to test the viability and costs of this technology for power plant emissions are worth pursuing. **Managing forests and agriculture:** We can fight global warming by reducing emissions from deforestation and forest degradation and by making our food production practices more sustainable. Because nuclear power results in few global warming emissions, an increased share of nuclear power in the energy mix could help reduce global warming—but nuclear technology poses serious threats to our security and, as the accident at the Fukushima Daiichi plant in Japan illustrates to our health and the environment as well. **Developing and deploying new low-carbon and zero-carbon technologies:** Research into and development of the next generation of low-carbon technologies will be critical to deep mid-century reductions in global emissions. Current research on battery technology, new materials for solar cells, harnessing energy from novel sources like bacteria and algae, and other innovative areas could provide important breakthroughs. The countries of the world—from the most to the least developed—vary dramatically in their contributions to the problem of climate change and in their responsibilities and capacities to confront it. A successful global compact on climate change must include financial assistance from richer countries to poorer countries to help make the transition to low-carbon development pathways and to help adapt to the impacts of climate change. **Adapting to changes already underway:** As the Climate Hot Map demonstrates, the impacts of a warming world are already being felt by people around the globe. If climate change continues unchecked, these impacts are almost certain to get worse. From sea level rise to heat waves, from extreme weather to disease outbreaks, each unique challenge requires locally-suitable solutions to prepare for and respond to the impacts of global warming. Unfortunately, those who will be hit hardest and first by the impacts of a changing climate are likely to be the poor and vulnerable, especially those in the least developed countries. Developed countries must take a leadership role in providing financial and technical help for adaptation. **Solutions to Global Warming.**

**Chapter 6 : Global Warming Solutions**

*Keeping the global temperature rise below degrees Celsius is still possible, but we have to take immediate and drastic measures. That is the conclusion of the Intergovernmental Panel on.*

### Chapter 7 : It's totally possible to limit global warming to degrees

*Global warming has the potential to seriously disrupt our food supply, drive costs upward, and affect everything from coffee to cattle, from staple food crops to the garden in your backyard. Destruction of coral reefs.*

### Chapter 8 : Help finding information | US EPA

*/ Gold / Gold News / Beware The 10th Of October: One Of Two Possible Remaining Dates For The Global Reset  
Beware The 10th Of October: One Of Two Possible Remaining Dates For The Global Reset September 23,*

### Chapter 9 : Assessing the BRICS Johannesburg Summit, potential enlargement | The Global

*The potential future effects of global climate change include more frequent wildfires, longer periods of drought in some regions and an increase in the number, duration and intensity of tropical storms.*