

anthropogenic climate change event in question might have been classified as an *extreme climate* or total that is itself extreme (season).

Faculae Bright patches of greater during periods of high

Feedback See *Climate feedback*

Fingerprint The *climate* specific forcing is commonly used to detect the presence are typically estimated using

Flux adjustment To avoid Ocean General Circulation unrealistic *climate* state, atmosphere-ocean fluxes of surface stresses resulting (surface) before these fluxes atmosphere. Because they are therefore independent of uncorrelated with the anomalies Chapter 8 of this report of report (Fourth Assessment adjustments, and that in general

Forest A vegetation type of the term *forest* are in differences in biogeography economics. For a discussion such as *afforestation*, *reforestation* Report on Land Use, Land-Use Change and Forestry (IPCC, 2000). See also the Report on Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types (IPCC, 2003).

Fossil fuel emissions Emissions of *greenhouse gases* (in particular *carbon dioxide*) resulting from the combustion of fuels from fossil carbon deposits such as oil, gas and coal.

Framework Convention on Climate Change See *United Nations Framework Convention on Climate Change* (UNFCCC).

Free atmosphere

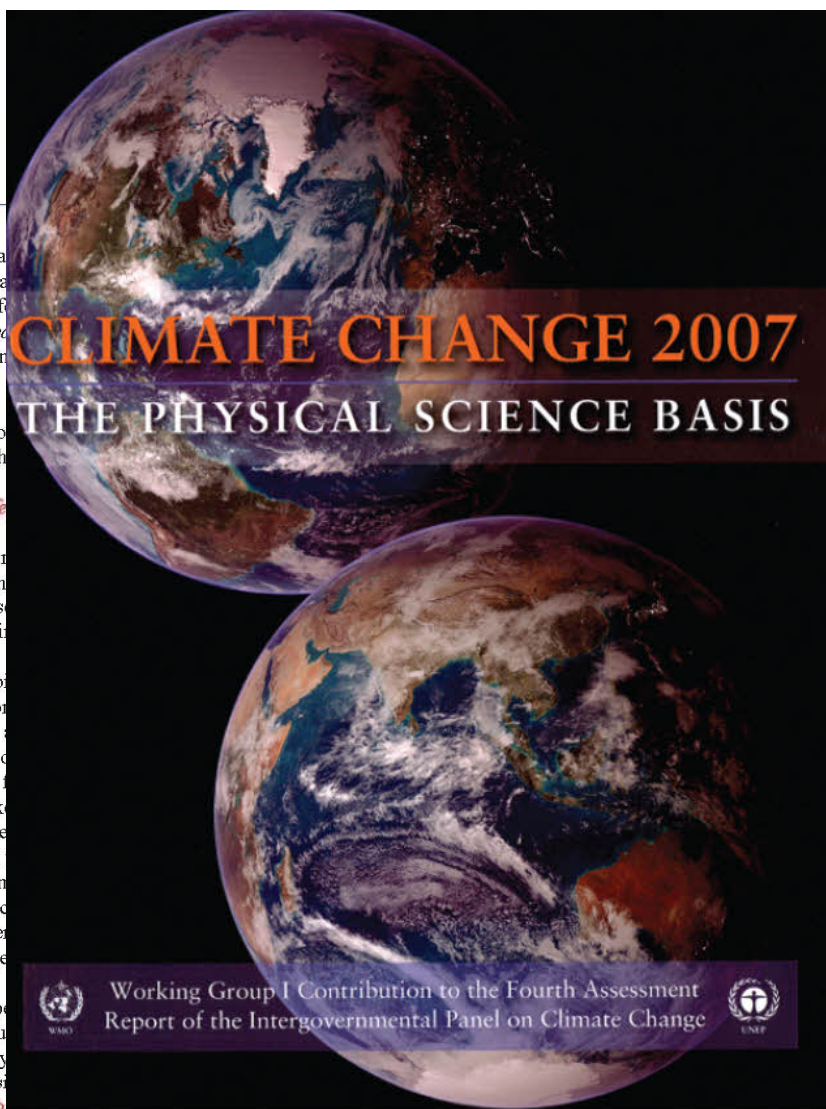
The atmospheric layer that is negligibly affected by friction against the Earth's surface, and which is above the *atmospheric boundary layer*.

Frozen ground Soil or rock in which part or all of the *pore water* is frozen (Van Everdingen, 1998). Frozen ground includes *permafrost*. Ground that freezes and thaws annually is called *seasonally frozen ground*.

General circulation The large-scale motions of the *atmosphere* and the ocean as a consequence of differential heating on a rotating Earth, which tend to restore the *energy balance* of the system through transport of heat and momentum.

General Circulation Model (GCM) See *Climate model*.

Geoid The equipotential surface (i.e., having the same gravity potential at each point) that best fits the mean sea level (see *relative sea level*) in the absence of astronomical tides; ocean circulations;



Earth rotation
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The geoid is
sheets, and at
zero-frequency
is the surface
levelling, and
modelling. In
of the geoid,
mentioned above

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force, and thus
and or current is
proportional to

nd.

under gravity
e base) and is
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high altitudes,
to the sea. See

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the Earth from

temperature is
ture. However,
rtures from a
area-weighted

global average of the *sea surface temperature* anomaly and *land surface air temperature* anomaly.

Global Warming Potential (GWP) An index, based upon radiative properties of well-mixed *greenhouse gases*, measuring the *radiative forcing* of a unit mass of a given well-mixed greenhouse gas in the present-day *atmosphere* integrated over a chosen time horizon, relative to that of *carbon dioxide*. The GWP represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in absorbing outgoing *thermal infrared radiation*. The *Kyoto Protocol* is based on GWPs from pulse emissions over a 100-year time frame.

Greenhouse effect *Greenhouse gases* effectively absorb *thermal infrared radiation*, emitted by the Earth's surface, by the *atmosphere* itself due to the same gases, and by clouds. Atmospheric radiation is emitted to all sides, including downward to the Earth's surface. Thus, greenhouse gases trap heat within the surface-*troposphere* system. This is called the *greenhouse effect*. Thermal infrared radiation in the troposphere is strongly coupled to the temperature of the atmosphere at the altitude at which it is emitted. In the troposphere, the temperature generally decreases with height. Effectively, infrared radiation emitted to space originates from an altitude with a temperature of, on average, -19°C , in balance with the net incoming *solar radiation*, whereas the Earth's surface is kept at a much higher temperature of, on average, $+14^{\circ}\text{C}$. An increase in the concentration of greenhouse gases leads to an increased infrared opacity of the atmosphere, and therefore to an effective radiation into space from a higher altitude at a lower temperature. This causes a *radiative forcing* that leads to an enhancement of the greenhouse effect, the so-called *enhanced greenhouse effect*.



Biologie, Chemie, Geografie, Physik für PS, Sek I, Sek II

total phänomenal

25. Treibhaus Erde

15:15 Minuten

00:50 Ohne Treibhauseffekt wäre die Erde ein lebensfeindlicher, eiskalter Planet mit frostigen minus 18 Grad Celsius. Für die derzeitige Durchschnittstemperatur von angenehmen plus 15 Grad Celsius sorgen etwa 1% Treibhausgase, welche in der Atmosphäre neben Sauerstoff und Stickstoff enthalten sind.

03:40 Doch der Mensch entlässt zusätzlich gewaltige Mengen an Treibhausgasen in die Atmosphäre, hauptsächlich CO₂. Dadurch heizt sich unser Planet zusätzlich auf. Dieser Prozess begann mit der Industrialisierung im 19. Jahrhundert. Sichtbare Folgen sind weltweit schmelzende Gletscher, auftauende Permafrostböden sowie abschmelzendes Packeis.

06:21 Dem Golfstrom verdanken wir unser mildes, mitteleuropäisches Klima. Im Golf von Mexiko tankt er mächtig Energie und transportiert diese Richtung Europa in den Nordatlantik. Hier sinkt das abgekühlte Wasser ab und fließt als Tiefenströmung zurück in den Süden. Dies könnte sich jedoch ändern, wenn am Nordpol weiterhin so viel Eis schmilzt. Forscher befürchten, dass der Golfstrom ins Stocken geraten könnte. Die Folge wäre ein Temperatursturz in Europa.

09:21 Der durch Menschen verursachte Treibhauseffekt wäre noch stärker, wenn die Weltmeere ihn nicht milderten. Sie nehmen grosse Mengen CO₂ auf. Dadurch wird das Wasser saurer. Dies hat zusammen mit der Erhöhung der Wassertemperatur negative Auswirkungen auf das gesamte marine Ökosystem. Zudem steigt der Meeresspiegel an.

11:10 Es ist schwer vorauszusagen, was sich an der Klimafont in den nächsten Jahrzehnten zusammenbraut. Am Deutschen Klimarechenzentrum Hamburg stehen 24 Grossrechner. Aufgrund der ausgewerteten Daten prophezeien Klimaforscher in den nächsten 100 Jahren eine Erwärmung um 4 Grad. Bereits jetzt nehmen Stürme und Hochwasser zu und Dürregebiete breiten sich aus. In der Südsee droht vielen Inseln der Untergang.