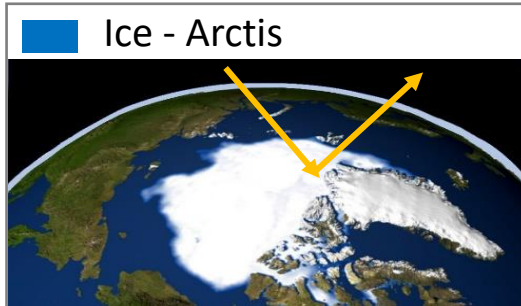
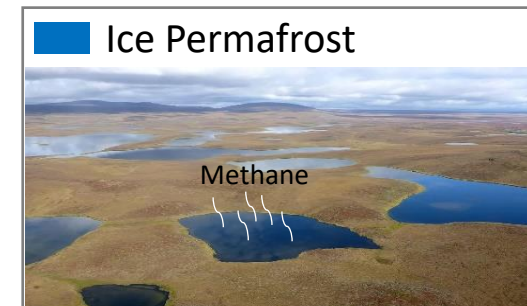


- Cryosphere Entities
- Circulation Patterns
- Biosphere Components



**Albedo**

The reflectivity of surfaces is called Albedo  $\alpha$  and is particularly high in ice. The white surfaces of the earth reflect 30% of solar radiation! What effect does global warming have on them? Is there feedback and what do they cause?



**Methane hydrate**

In the permafrost regions, large quantities of methane are stored in crystal form, so-called methane hydrates. At higher temperatures it decays and the methane (a powerful greenhouse gas) is released into the atmosphere. Where are these areas and are there feedback effects?



**Ice melting in the north**

As temperatures rise, the entire ice sheet on land becomes unstable and slides into the sea. A lubricating film forms at the bottom of the ice sheet, which grows due to meltwater. Where on earth does this happen? And is there feedback? What kind of feedback?



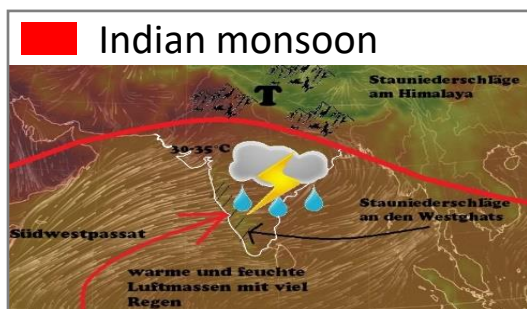
**Stored methane**

Large quantities of methane hydrates are stored at the bottom of seas and lakes. At higher temperatures it decomposes and methane (a powerful greenhouse gas) is released into the atmosphere. Where are these areas and are there feedback effects?



**Ice melting in the south**

As temperatures rise, the entire ice sheet on land becomes unstable, but the ice on the sea also disappears. The mainland glaciers then slide unchecked into the sea. Where does this happen on earth? And is there feedback here?

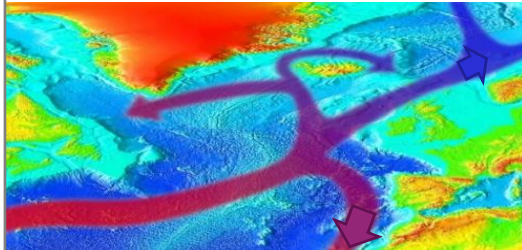


**Floods**

In summer the air above this part in the world up to 50 °C hot. As the air rises a low-pressure system is formed which attracts humid air from the ocean. This air flows over land and rains heavily. What happens when it gets warmer? Is there feedback here?



### Atlantic Circulation



### Too much sweet water

Water currents in the North Atlantic are caused by differences in water temperature and salt concentration. Denser water sinks. The melting of ice on Greenland changes the salt concentration of the water. What happens then?

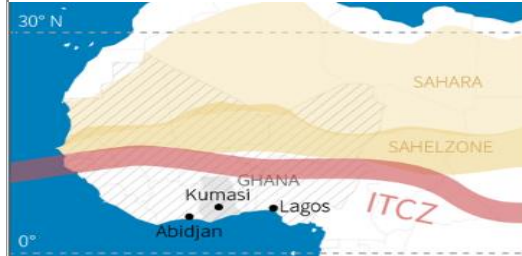
### Amazon Rainforest



### The lungs of the world

The tropical rainforests are buffers in the earth's climate system. Plants absorb CO<sub>2</sub> and store it as biomass. Most of the rainfall comes from water evaporated above the forest. The Amazon is burning due to global warming and deforestation. What happens then?

### West Africa Monsoon



### Humid air from the Atlantic

In West Africa, the hot air rises rapidly, creating a low-pressure system. Humid air flows from the Atlantic and rains heavily over the mainland. The Sahel could become drier or greener, depending on the situation. What does this mean for the population?

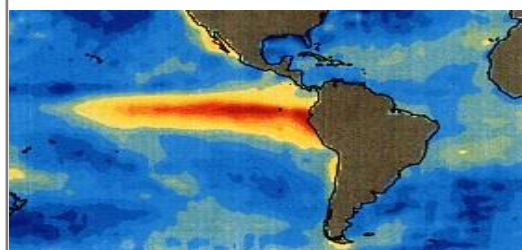
### Tropical coral reefs



### Colours that fade

The coral reefs formed by cnidarians in the sea, form unique Ecosystems with an almost infinite variety of animal and plant species. At the same time, coral reefs contribute to the food supply of millions of people. What happens to them as a result of climate change?

### El Niño



### Pacific Current

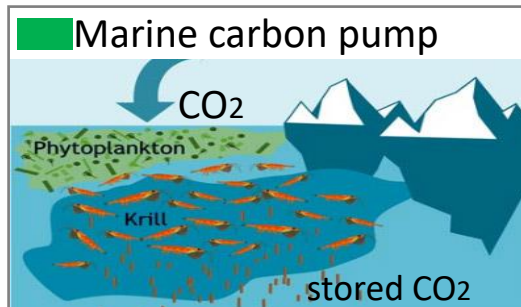
In the case of El Niño, the sea surface in the equatorial Pacific heats up more than normal. This causes heat in Australia, South East Asia and South Africa. The rain that is missing there falls abundantly over the west coast of South America. What happens when the equator gets warmer?

### Boreal forests



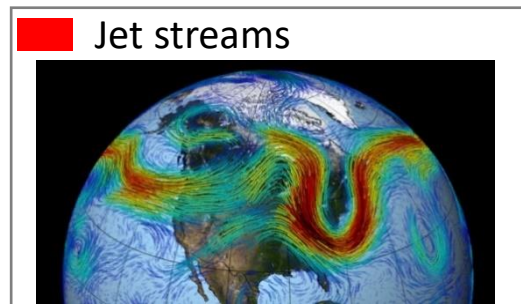
### Protective Greens

The effects of climate change in the boreal forests are devastating. It is too warm and too dry. Infestation by insect pests, strong storms and fires are killing the forests. Deforestation would give them the rest. Are there feedback effects?



**Gelagerte CO<sub>2</sub>**

Plankton at the surface of the oceans absorbs CO<sub>2</sub>. Krill eats the plankton and deposits the CO<sub>2</sub> on the seafloor through the excretions. What happens to the plankton when the water gets warmer? Are there feedback processes?



**Air currents in the north**

The jet stream winds its way around the northern hemisphere at an altitude of 7 to 12 kilometres. It separates the cold air of the north from the warmer south. It is now so slow that major weather situations such as cold and heat waves, floods and droughts do not disappear for many weeks.