Planet Press

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Credit: Catherine Moody

More droughts in Europe?

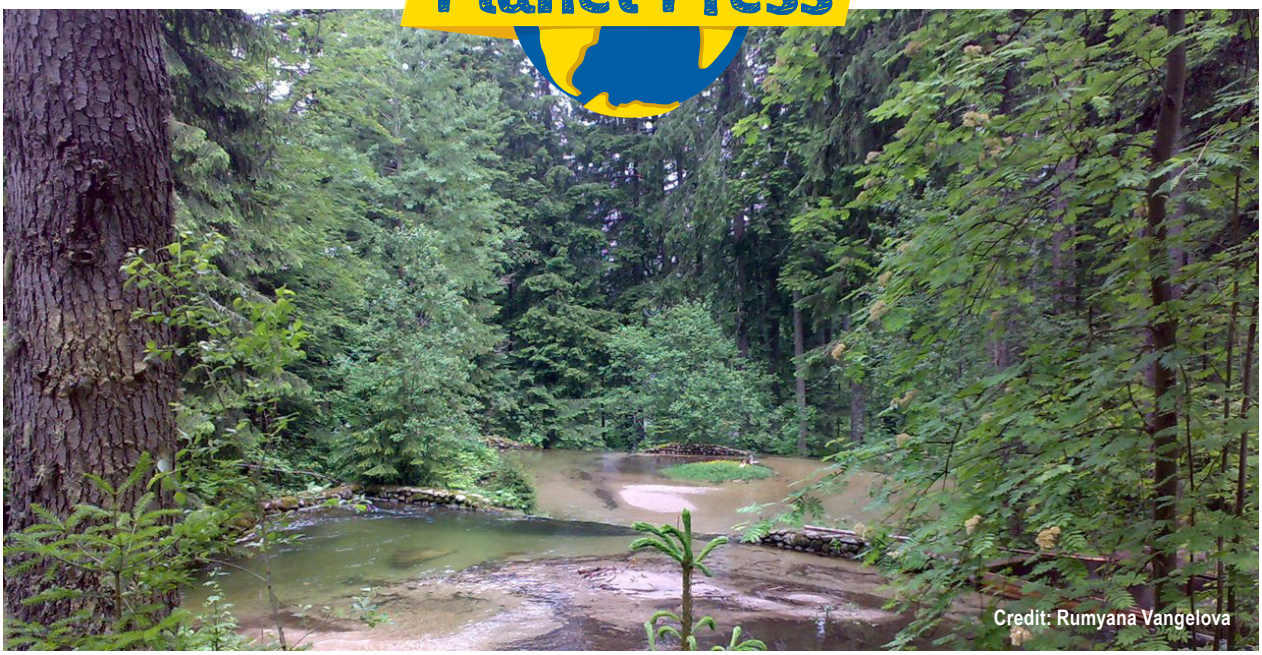
Italian scientist Giovanni Forzieri and his team of researchers have predicted more extreme weather in the next few decades. They say that drought (an extended period of dry weather with little or no rain) could happen more often and become more severe.

The climate is changing and the planet is getting warmer. Giovanni and his team are trying to understand if a rise in global average temperature along with an increase in the use of water across Europe – for farming, industry and daily use by a growing population – could have an impact on drought. Higher temperatures would cause more evaporation; as a consequence, less water would be available for the population. This issue is very important, as water is necessary to all living creatures and drought has cost Europe over €100 billion in the past 30 years.

Giovanni and his team have used computer models to try to figure out what will happen to rivers across Europe up until the year 2100. Their results depend on how much the temperature across the continent will increase and on how much water we will use in the future. The researchers found that, due to climate change alone, the amount of water flowing in streams and rivers could be reduced down to almost half the current levels, particularly those in Southern Europe. Adding excessive use of water by humans to future climate warming means that droughts are likely to be a lot worse in the next century or so. The team warns that periods with severe water shortages might be much more frequent and long-lasting in the future.

Giovanni says that the results of this study show that it is important for people to know how to use water without wasting it, and that governments need to take climate change into account when planning rules for the use of water.

This is a kids' version of the European Geosciences Union (EGU) press release 'Europe to suffer from more severe and persistent droughts'. It was written by Jane Robb and reviewed for scientific content by Sam Illingworth and Alice Aubert and for educational content by Maria Vittoria Barbarulo. For more information check: http://www.egu.eu/education/planet-press/.


Credit: Rumyana Vangelova

Ancient forests kept Earth's climate under control

Carbon dioxide is a gas that acts like a big blanket over the Earth. It traps heat, keeping us warm. While too much carbon dioxide in the atmosphere can cause the Earth to get too hot (like what is happening at the moment with global warming), not enough carbon dioxide in the atmosphere can cause the Earth to cool down too much, which would be bad for plants and animals.

In the last 24 million years, conditions on Earth meant that there might have been very low levels of carbon dioxide in the atmosphere – levels that could have led to very cold conditions, but did not. Scientists have been asking why this was, and a team of researchers in the UK may have now found an answer.

Before humans burnt oil, coal and gas for energy, nature kept carbon dioxide in the atmosphere under control. Volcanic eruptions, for example, release carbon dioxide, while weathering (breaking down rocks through natural processes like wind and rain) removes it from the atmosphere and stores it in other rocks, soils and the oceans over millions of years.

Forests increase weathering rates because trees, and the fungi associated with their roots, break down rocks and minerals in the soil to get nutrients for growth. But British scientist Joe Quirk and his team recently found that when there is less carbon dioxide in the atmosphere, trees and fungi aren't as good at breaking down minerals. This means that the weathering slows down, and more carbon dioxide is left in the atmosphere, allowing the Earth to stay warm.

So why is this important to us? Joe explains: "our study makes an important step forward in understanding how Earth's complex plant life has regulated and modified the climate we know on Earth today."

Fun facts

How do fungi break down rocks?

The fungi that live on tree roots are called Mycorrhiza, and they work with the trees to make each other's food. The Mycorrhiza feed the tree nutrients (food) from the soil and the tree gives the Mycorrhiza some of the carbon it creates from photosynthesis. These fungi are very small and thin and can fit everywhere. If you took the tiny strands out of only 1 kg of soil and laid them end to end, they would measure 200 km! The fungi are also very strong: they can bend mineral fragments in soil or rock. Once the fungi have bent the minerals, they start taking out the important nutrients – like potassium – and passing them to the tree. This makes the minerals even weaker, so they break down into new minerals – the ones that make up soils.

This is a kids version of the European Geosciences Union (EGU) press release 'Ancient forests stabilised Earth's CO2 and climate'. It was written by Jane Robb and reviewed for scientific content by Sam Illingworth and Frederike Wittkopp and for educational content by Abigail Morton. For more information check: http://www.egu.eu/education/planet-press/.

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Credit: Ian Joughin, PSC/APL/UW

Fastest glacier ever!

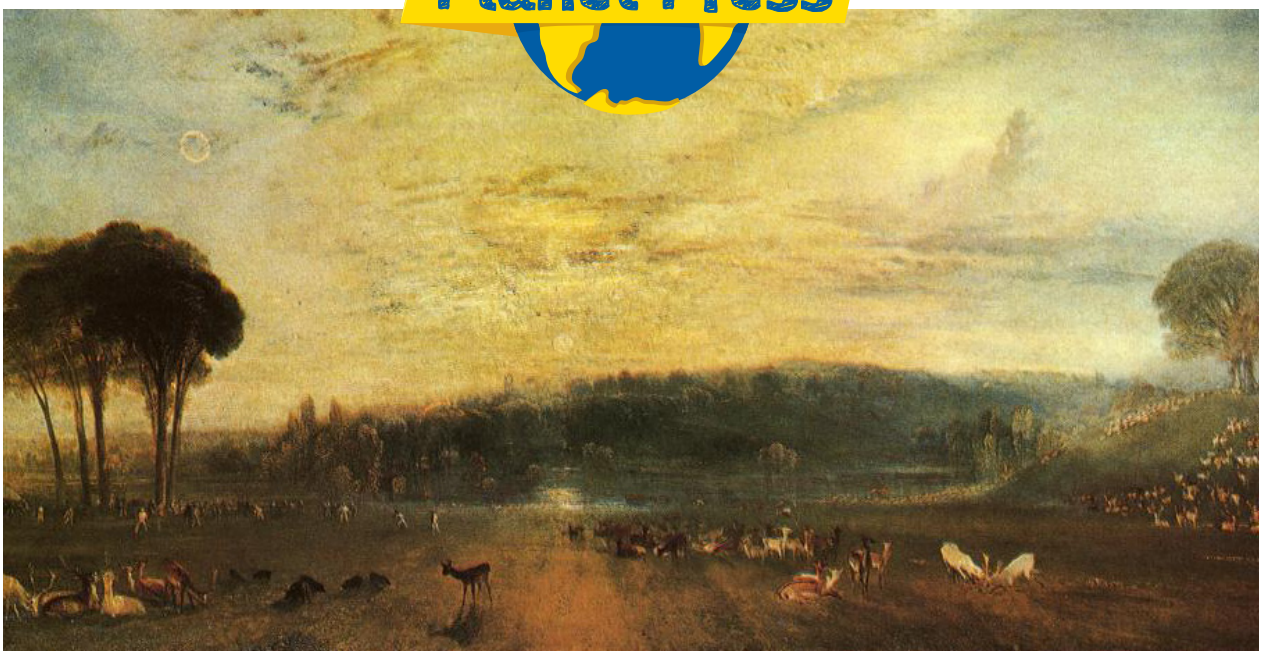
Jakobshavn Isbræ meaning 'Jakobshavn Glacier' (pronounced ya-cub-shaw-ven) in Greenland is famous because it is the glacier that is believed to have produced the iceberg that sank the Titanic. But now, it has another claim to fame as being the fastest moving glacier ever recorded in Greenland or Antarctica. The glacier has always been fast – even in the 1990s it was considered to be one of the fastest moving glaciers in the world – but American and German scientists have confirmed that it is now moving at almost four times its previous speed!

The scientists do this by looking at photographs taken by satellites on different days. By looking how much the glacier has moved between two days they can work out the speed it's moving. In the summer of 2012, Ian Joughin and his team from the University of Washington measured the glacier's speed at 46 metres per day – in other words, the glacier was travelling the length of about two tennis courts in just 24 hours! The speed of the glacier is highest in the summer because it is warmer, causing the exposed front of the glacier to melt faster. The ice at the front of the glacier normally holds the weight of the rest of the glacier back, but as the front melts rapidly the weight at the back is able to move the glacier with greater force, resulting in greater speeds.

The speed the glacier is moving is very important because, as the glacier is moving and melting at faster speeds, it feeds more water into the oceans and raises sea levels across the world. As Ian explains: "We know that from 2000 to 2010 this glacier alone increased sea level by about 1 mm. With the additional speed it likely will contribute a bit more than this over the next decade."

Ian and his fellow scientists' research is important because it helps us understand how much sea levels will rise in the future and whether this may affect people living in coastal areas.

This is a kids' version of the European Geosciences Union (EGU) press release 'Greenland's fastest glacier reaches record speeds'. It was written by Jane Robb and reviewed for scientific content by Sam Illingworth and Timothy Lane and for educational content by Sally Dengg. For more information check: http://www.egu.eu/education/planet-press/.



Researchers used images of old paintings, such as this one by the British artist J. M. W. Turner in 1829, to study the Earth's past atmosphere.

Art reveals secrets about Earth's past atmosphere

When artists paint landscapes most of them try to capture what they see as best they can, including the colours of the clouds and the skies.

Christos Zerefos and his team of Greek and German researchers and a Greek painter have recently found that the colours of sunsets painted by artists as far back as 1500 can actually tell us how polluted the atmosphere was in the past! For instance, when volcanoes erupt they spew lots of polluting gas and ash into the atmosphere, making it more hazy. This effect can cause sunsets to appear more orange and red for several years, because of the way the volcanic particles scatter sunlight. A similar effect occurs when the air is polluted with dust from deserts, or from man-made industrial processes (eg. coal-fired power stations).

Christos and his team looked at hundreds of photographs of old paintings from the years 1500 to 2000, a period during which there were around 50 large volcanic eruptions across the world. They found that sunsets painted shortly after a volcanic eruption tended to show more red colours rather than green, indicating a more polluted atmosphere. By analysing many of these old works of art, the team found a relationship between the paintings' sunset colours and the amount of polluting particles in the past atmosphere, with more red indicating higher levels of pollution.

This research can help other scientists make models of the past climate, as volcanic eruptions and man-made pollution can heavily influence the Earth's atmosphere. In turn, this can help scientists predict how our atmosphere and our climate will change in the future.

Fun facts

How do volcanic eruptions and pollution affect climate?

When volcanoes erupt, they spew lots of ash and gas into the atmosphere. Some of the gas condenses to form tiny solid and liquid particles (less than a millimetre in diameter) that can reflect sunlight in all directions. During eruptions the skies quickly fill with these sunlight-reflecting particles, making the atmosphere hazier. Usually this happens in the vicinity of volcanos, but if the eruption is large enough, the effect can be seen around the globe! With less sunlight reaching the Earth's surface, these regions get less warmth from the Sun, causing them to cool.

Sunlight is a mix of the seven colours of the rainbow: red, orange, yellow, green, blue, indigo and violet. At sunset, the distance that light from the Sun has to travel through the Earth's atmosphere is at a maximum. Through reflections with particles in the atmosphere, this sunlight loses lots of its blue, indigo and violet colours, leaving the red, orange and yellow colours to reach our eyes. The particles from volcanic eruptions are even better at stopping blue colours from reaching us, and turn the sky even more red.

Manmade pollution also causes lots of tiny particles to be released into the atmosphere: if you go into some cities like Beijing in China the air is hazy with these tiny particles. These manmade, polluting particles can affect the atmosphere in a similar way to volcanic particles.

This is a kids' version of the European Geosciences Union (EGU) press release 'Famous paintings help study the Earth's past atmosphere'. It was written by Jane Robb and reviewed for scientific content by Sam Illingworth and Kirsty Pringle, and for educational content by Phil Smith. For more information check: http://www.egu.eu/education/planet-press/.

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Credit: Eva Nowatzki

Satellites and sea ice

The Earth has been getting warmer because our factories and cars release carbon dioxide and other gases into the atmosphere, which trap heat from the Sun inside it. As the temperature rises, you would expect the ice on our planet – in glaciers around the world and at the poles – to be melting faster.

This is in fact what is happening to sea ice (frozen sea water) in the Arctic, the polar region at the far north of the Earth: it has been melting very fast. But at the southernmost part of our planet, in the Antarctic, the amount of sea ice has actually been increasing. Scientists have been scratching their heads trying to figure out why.

Now, a team of scientists lead by the American Ian Eisenman has suggested that maybe the amount of sea ice in the Antarctic hasn't been increasing as fast as people had thought. The researchers say that some of the measured increase may not be real: it could, in fact, be due to an error in the way satellite observations were interpreted.

We know that sea ice is disappearing in the Arctic and increasing in the Antarctic because we have satellites looking down on the Earth that tell us what's happening from above. But the observations can be complicated and hard to interpret. While scientists have very clever methods of doing this, they have to look at so many observations, it is only natural a mistake happens from time to time.

Then, scientists like Ian come along to help improve the way we look at these satellite observations. And they get to use them to solve mysteries like why the Antarctic sea ice appears to be increasing so fast in a warming world!

This is a kids' version of the European Geosciences Union (EGU) press release 'Has Antarctic sea ice expansion been overestimated?'. It was written by Bárbara Ferreira and reviewed for scientific content by Richard Selwyn Jones and Ian Eisenman, and for educational content by Marina Drndarski. For more information check: http://www.egu.eu/education/planet-press/.

Credit: SERPENT Project/D.O.B. Jones, L. Levin, UK's BIS Department

Wonders of the deep sea

Have you ever seen Finding Nemo, the animation film about the adventures of a clownfish in search of his son? This movie is one of the many that has been inspired by the deep sea, an untouched and fascinating environment with strange life forms and many wonders!

The deep sea – ocean areas deeper than 200 m – is vast, dark and remote, but it is teeming with life and riches. There, you can find oil and gas, needed to provide heating and electricity, and minerals and metals that are used in our cell phones and batteries. You can even make jewellery from deep-sea corals, and other life forms from this environment, such as bacteria and sponges, can be used to make medicines.

US scientist Andrew Thurber got an international team of researchers together to tell everyone about the deep sea, and why we should protect it. They say that the deep sea is very important because it nurtures different kinds of fish and removes carbon dioxide from our atmosphere. The Earth's climate has been changing because our factories, power plants and cars release carbon dioxide and other gases into the atmosphere, contributing to the heating up of our planet. The deep sea has stored away a lot of this gas, so has helped limit the effects of the warming.

The deep sea may be distant and very hard to visit, but it affects us in many ways. We need to treasure it and care for it because it provides a lot of the things we need in our daily lives and it is important to the health of our planet.

Fun facts

Some (more) amazing things about the deep sea

One of the most incredible things about the deep sea are hydrothermal vents. These are areas on the sea floor littered with structures that look like chimneys that pour hot, mineral-rich water from under the seabed. They are a bit like hot springs and geysers on land, forming due to volcanic activity. Hydrothermal vents harbour unique animals that thrive in the warm and chemical-rich environment around them and do not depend on sunlight to live. One of the most fascinating is the giant tube worm. It can grow up to two metres in length and, unlike other animals, does not have a mouth to eat! Instead, it gets its food with the help of bacteria living inside it.

There are many more strange and amazing creatures in the deep sea. The vampire squid, for example, has eyes that – compared to the size of its body – are the largest on Earth. There is also a species of fish, Pacific viperfish, that has teeth so large it can't close its mouth. You can find photos of these and other fascinating creatures at http://ocean.nationalgeographic.com/ocean/photos/deep-sea-creatures/.

How can you help protect the deep sea?

There are many ways to help out the ocean and make the way we use it more sustainable (that is, without overusing its resources so that they can last for a long time). One way is to cut down on plastic, by using reusable bags instead of plastic ones and buying things without much packaging to cut down on waste. Plastic pollution is a big problem in the ocean, with many marine animals mistaking it for food. Plastic has even been found in the deepest part of the sea, reaching a part of the world we humans haven't even been before!

Another way to help is to make sure you're eating the right fish – while some types of fish have healthy populations, others are being overfished. If we take lots of fish out of the sea before they've reproduced, their population can't grow. And, if we take too many, their population quickly shrinks. This overfishing is an even bigger problem for fish that live for a long time, like deep-sea perch, which can (without fishing) live for almost 150 years! Some supermarkets show which fish are sustainable (you can find this information at http://www.msc.org/cook-eat-enjoy/fish-to-eat), so keep your eye out for them if you're helping do the shopping.

Finally, spread the word. The deep sea is far from sight, so people can forget about it easily. Tell your friends and family what you know about the ocean and help them find out how important it is!

This is a kids' version of the European Geosciences Union (EGU) press release 'From Finding Nemo to minerals – what riches lie in the deep sea?'. It was written by Bárbara Ferreira and Sara Mynott and reviewed for scientific content by Andrew Thurber and Jeroen Ingels and for educational content by Sally Dengg. For more information check: http://www.egu.eu/education/planet-press/.

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Credit: Gerald Wetzel, distributed via imaggeo.egu.eu

How tall are the ice sheets?

The ice sheets, which cover the majority of Antarctica (at the very south of our planet) and Greenland (at the north), are made up of frozen snow (ice). Snow falls over the ice sheets and then flows to lower-altitude coastal areas, where it either melts or breaks off into the ocean as icebergs. German scientists have measured how tall the various parts of Antarctica and Greenland are to find out where there are icy mountains and where there are low-lying areas.

By bouncing powerful radar beams from a satellite, the German team created very detailed maps of how the height changes across the ice sheets. Their maps cover an area more than three times the size of the European Union, including an area the size of Spain not previously measured by satellite radar!

The researchers also wanted to know which parts of Greenland and Antarctica are growing bigger, and which are shrinking. Where they grow bigger, ice is getting thicker because more snow is falling there than melts or flows towards the coast. Where they shrink, they are losing ice as it melts into the atmosphere or away into the sea.

They studied changes in the ice sheets by measuring how height has changed from 2011 to 2014. They found that many parts of Greenland and Antarctica are losing height and shrinking, meaning the ice is melting away faster than new snow is collecting on the ice sheets. The scientists say the two ice sheets combined are losing 500 cubic kilometres of ice into the sea each year, roughly the water volume of Lake Erie in North America! This means that ice-sheet melting has contributed to sea level rise more than previously thought.

Luckily these new measurements and super-detailed height maps mean we can track how the ice sheets are growing and shrinking in much more detail than ever before.

This is a kids' version of the European Geosciences Union (EGU) press release 'Highs and lows: height changes in the ice sheets mapped'. It was written by Laura Roberts and reviewed for scientific content by Daniel J. Hill and Timothy Lane, and for educational content by Abigail Morton. For more information check: http://www.egu.eu/education/planet-press/.

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Geoscientific news for children

Planet Presses are short versions of European Geosciences Union (EGU) press releases – articles for journalists based on scientific research published in EGU journals – written in child-friendly language. The project aims to get children (mainly 7–13 year olds), and their parents and educators, interested in and engaged with up-to-date scientific research and news in the Earth, planetary and space sciences. Teachers are encouraged to use Planet Press as an educational tool in their classrooms.

Each Planet Press is reviewed by at least one researcher (working in the scientific area of the press release) and by one educator. All texts are available in English, with some translated into Spanish, Turkish, Greek, French, German, Swedish, Italian, Serbian, Portuguese or Russian.

For more information, check http://www.egu.eu/education/planet-press/.

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