



*Adarsh Shikshan Mandal's*

**KONARK IDEAL COLLEGE OF SCIENCE & COMMERCE**

(Affiliated to University of Mumbai) (Hindi Linguistic Minority College)

CAMPUS : Adarsh Vidya Nagari, At.Wasar (Bhal), Post-Dwarli, Via Kalyan Railway Station,  
Haji Malang Road, Dist.Thane(MS) 421306. PH. : (0251) 3204294 / 3204394

E-mail : [konarkideal@idealcollege.in](mailto:konarkideal@idealcollege.in)

Web-[www.idealcollege.in](http://www.idealcollege.in)

**Ideal Nature Club**  
**Presents**

**“AANGAN BOOKLET”**

**YEAR 2019-2020**

**VOL 1**

**INDEX**

<b>Sr No.</b>	<b>Title</b>	<b>Page No.</b>
1	Deforestation: Tropical tree losses persist at high levels	3
2	Climate change: What next for saving the planet?	5
3	Climate change: Global impacts 'accelerating' - WMO	6
4	Cyclone Idai: What's the role of climate change?	8

• **Deforestation: Tropical tree losses persist at high levels**



Around 12 million hectares of forest in the world's tropical regions were lost in 2018, equivalent to 30 football fields per minute.

While this represents a decline on 2016 and 2017, it is still the fourth highest rate of loss since records began in 2001.

Of particular concern is the continued destruction of what are termed primary forests.

An area of these older, untouched trees the size of Belgium was lost in 2018.

- Amazon deforestation 'worst in 10 years'
- Are UK barbecues fuelling deforestation?
- Can these seedballs solve Kenya's deforestation crisis?

Why is this new data important?

The Global Forest Watch report paints a complex picture of what's going on in the heavily forested tropical regions of the world that range from the Amazon in South America, through West and Central Africa to Indonesia.

The forests of the Amazon basin are home to an estimated 20 million people. Among them are dozens of tribes living in voluntary isolation.

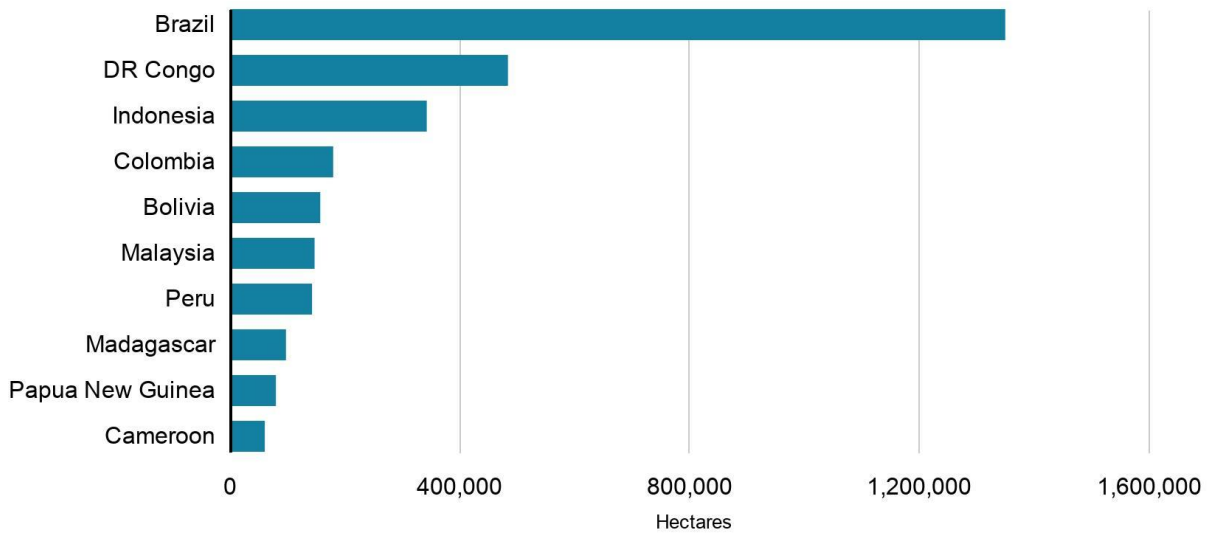
As well as providing food and shelter, the trees in these regions are important to the world as stores of carbon dioxide and play a key role in regulating global climate change.

Millions of hectares of these forests have been lost in recent decades, having been cleared by commercial or agricultural interests.

The data from 2018 shows a drop from the previous two years, which saw a huge amount of trees lost to fire.

However, those involved in the research say this good news is somewhat qualified.

## Countries with the greatest primary forest loss in 2018



Source: World Resources Institute



"It's really tempting to celebrate a second year of decline since peak tree-cover loss in 2016," said Frances Seymour from the World Resources Institute, who runs Global Forest Watch.

"But if you look back over the last 18 years, it is clear that the overall trend is still upwards. We are nowhere near winning this battle."

What are primary forests and why do they matter?

Primary forests are those that exist in their original condition and are virtually untouched by humans.

Sometimes referred to as old growth forests, these areas can harbour trees that are hundreds, even thousands, of years old.

They are critical to sustaining biodiversity, and are home to animals including jaguars, tigers, orang-utans and mountain gorillas.

These old forests really matter as stores of carbon dioxide, which is why the loss of 3.6 million hectares in 2018 is concerning.

"For every hectare of forest loss, we are one step closer to the scary scenarios of runaway climate change," said Frances Seymour.



• **Climate change: What next for saving the planet?**



Like superheroes, their job is to save the planet and this week 180 climate scientists are meeting in Edinburgh to plan their next move.

To be technical, they are Working Group III of the Intergovernmental Panel on Climate Change (IPCC) - but clearly that doesn't sound so exciting.

Six months ago, the IPCC warned the world that "rapid, far-reaching and unprecedented" changes were needed if the climate crisis was to be tackled effectively.

Those same scientists will this week begin the next phase of that work in Scotland's capital.

- Final call to save the world from 'climate catastrophe'
- Five things we have learned from the IPCC report
- What is in the Paris climate agreement?

Co-chair, Prof Jim Skea, who is originally from Dundee, said: "Our ambition is to equip governments with the information they need to act now, keeping in mind the goals of the Paris Agreement and national ambitions to achieve net zero emissions."

The Paris Agreement, reached in 2015, committed the world's nations to keeping global temperature rises "well below" 2C and "endeavour to limit" them to 1.5C. But, after years of research, the IPCC warned in October 2018 that almost all the world's coral reefs would be destroyed if the higher temperature was reached.

The work beginning in Edinburgh will assess the mitigation of climate change - that is, what can be done to slow it down.

It will examine the link between greenhouse gas emissions and the way we live our lives.

The role of technology, through schemes such as carbon capture and storage, will also be scrutinised.

Co-chair Priyadarshi R Shukla added: "This report will provide governments with scientific information to underpin responses to climate change in the context of sustainable development."

Climate Change Secretary Roseanna Cunningham said: "The IPCC provides governments at all levels and across the world with scientific information that can, and in my view should, be used to inform our climate change priorities.

"Their role is one that I am deeply respectful of and I am pleased that we have been able to support their work in this way."

The meeting is being hosted by the Scottish government at the John McIntyre Conference Centre.

- **Climate change: Global impacts 'accelerating' - WMO**



The World Meteorological Organization (WMO) says that the physical and financial impacts of global warming are accelerating.

Record greenhouse gas levels are driving temperatures to "increasingly dangerous levels", it says.

Their report comes in the same week as the International Energy Agency (IEA) reported a surge in CO2 in 2018.

However, new data from the UK suggests Britain is bucking the trend with emissions down by 3%.

- Drilling climate history in 'Iceberg Alley'
- Sir David to present climate change film

- Cyclone Idai and the climate connection

This year's State of the Climate report from the WMO is the 25th annual record of the climate.

When it first came out in 1993, carbon dioxide levels were at 357 parts per million (ppm) in the atmosphere. These have now risen to 405.5ppm and are expected to increase further.

This is having a significant impact on temperatures, with 2018 the fourth warmest year on record, almost 1C above what they were in the period between 1850-1900.

The years between 2015 and 2018 were the four warmest on that record, the study says.

"This report makes it very clear that the impacts of climate change are accelerating," said Prof Samantha Hepburn who is director of the Centre for Energy and Natural Resource Law at Deakin University in Australia.

"We know that if the current trajectory for greenhouse gas concentrations continues, temperatures may increase by 3 - 5 degrees C compared to pre-industrial levels by the end of the century and we have already reached 1 degree."

While some of these figures were **published in a preliminary release** of the study from last November, the full version has data on many key climate indicators, that the WMO says break new ground.

One example is ocean heat content. More than 90% of the energy trapped by greenhouse gases goes into the seas and according to the WMO, 2018 saw new records set for the amount of ocean heat content found in the upper 700 metres of the seas, and also for the upper 2,000 metres.

Sea levels also continued to increase with global mean sea level rising 3.7mm higher in 2018 than the previous year.

"This report highlights the increase in the rate of sea-level rise, and this is a real concern for those living in low-lying coastal areas, for both developed and developing countries," said Dr Sally Brown, a research fellow at the University of Southampton.

"We know that sea-level rise is a global problem that will not go away, and efforts need to be made to help those who are really vulnerable to adapt to sea-level rise or move to safer areas."

#### 2018 Climate impacts

- According to the report, most of the natural hazards that affected nearly 62 million people in 2018 were associated with extreme weather and climate events.
- Some 35 million people were hit by floods.
- Hurricane Florence and Hurricane Michael were just two of 14 "billion dollar disasters" in 2018 in the US.

- Super Typhoon Mangkhut affected 2.4 million people in and killed 134, mainly in the Philippines.
- More than 1,600 deaths were linked to heat waves and wildfires in Europe, Japan and US.
- Kerala in India suffered the heaviest rainfall and worst flooding in nearly a century

The head of the WMO say that the signals of warming continue to be seen in events since the turn of the year.

"Extreme weather has continued in the early 2019, most recently with Tropical Cyclone Idai, which caused devastating floods and tragic loss of life in Mozambique, Zimbabwe and Malawi. It may turn out to be one of the deadliest weather-related disasters to hit the southern hemisphere," said WMO Secretary General Petteri Taalas.

"Idai made landfall over the city of Beira: a rapidly growing, low-lying city on a coastline vulnerable to storm surges and already facing the consequences of sea level rise. Idai's victims personify why we need the global agenda on sustainable development, climate change adaptation and disaster risk reduction," said Mr Taalas.

The report has been launched at a news conference in New York attended by the UN Secretary General Antonio Guterres.

- **Cyclone Idai: What's the role of climate change?**



Unless a rich benefactor steps in, the role of human-induced climate change in Cyclone Idai is unlikely to be clearly determined.



The scientists with the expertise simply don't have the resources to do the large amount of computer modelling required.

However, there are a number of conclusions about rising temperatures that researchers have gleaned from previous studies on tropical cyclones in the region.

- 'Tell the world we are suffering'
- 'My hotel haven for cyclone homeless'
- England water shortage 'within 25 years'
- Greenpeace rebukes Trump for climate tweet

While Cyclone Idai is the seventh such major storm of the Indian Ocean season - more than double the average for this time of year - the long-term trend does not support the idea that these type of events are now more frequent.

"The interesting thing for the area is that the frequency of tropical cyclones has decreased ever so slightly over the last 70 years," said Dr Jennifer Fitchett from the University of the Witwatersrand in South Africa who has studied the question.

"Instead, we are getting a much higher frequency of high-intensity storms."

Climate change is also changing a number of factors in the background that are contributing to making the impact of these storms worse.

"There is absolutely no doubt that when there is a tropical cyclone like this, then because of climate change the rainfall intensities are higher," said Dr Friederike Otto, from the University of Oxford, who has carried a number of studies looking at the influence of warming on specific events.

"And also because of sea-level rise, the resulting flooding is more intense than it would be without human-induced climate change."

According to researchers, about seven different ocean or atmospheric conditions are required for cyclone formation and normally only a couple of these occur. However, because of climate change, more and more of these conditions are coinciding with each other and that's why these big storms happen very quickly. Whatever arguments about the impacts of climate change on tropical cyclones, the damage caused in Mozambique has much more to do with the vulnerability of people on the ground than rising temperatures.

"If you look at North America, they are experiencing Category 5 cyclones quite regularly now, and they don't experience the level of damage that Mozambique is seeing," said Dr Fitchett.

"When a storm like this comes along, the potential for devastation is infinitely higher. A city like Beira is at much higher risk, because not only have you many more people there, it's also so much more difficult for them to get out."



**PREPARED BY:**

1. SANE PRADEEP
2. NIKAM ANKUSH
3. PANDEY RIYA
4. THAKRE YASH



*Adarsh Shikshan Mandal's*

**KONARK IDEAL COLLEGE OF SCIENCE & COMMERCE**

(Affiliated to University of Mumbai) (Hindi Linguistic Minority College)

CAMPUS : Adarsh Vidya Nagari, At.Wasar (Bhal), Post-Dwarli, Via Kalyan Railway Station,  
Haji Malang Road, Dist.Thane(MS) 421306. PH. : (0251) 3204294 / 3204394

E-mail : [konarkideal@idealcollege.in](mailto:konarkideal@idealcollege.in)

Web-[www.idealcollege.in](http://www.idealcollege.in)

# **Ideal Nature Club** **Presents**

## **“AANGAN BOOKLET”**

### **YEAR 2019-2020**

### **VOL 2**

**INDEX**

<b>Sr No.</b>	<b>Title</b>	<b>Page No.</b>
1	Big rise in atmospheric CO2 expected in 2019	3
2	Climate change: China coal surge threatens Paris targets	5
3	Climate change: 12 years to save the planet? Make that 18 months	7
4	Climate change: Heatwave made 'at least' five times more likely by warming	9

- **Big rise in atmospheric CO2 expected in 2019**



Met Office researchers expect to record one of the biggest rises in atmospheric concentrations of CO2 in 2019.

Every year, the Earth's natural carbon sinks such as forests soak up large amounts of CO2 produced by human activities.

But in years when the tropical Pacific region is warmer like this year, trees and plants grow less and absorb smaller amounts of the gas.

As a result, scientists say 2019 will see a much bigger CO2 rise than 2018.

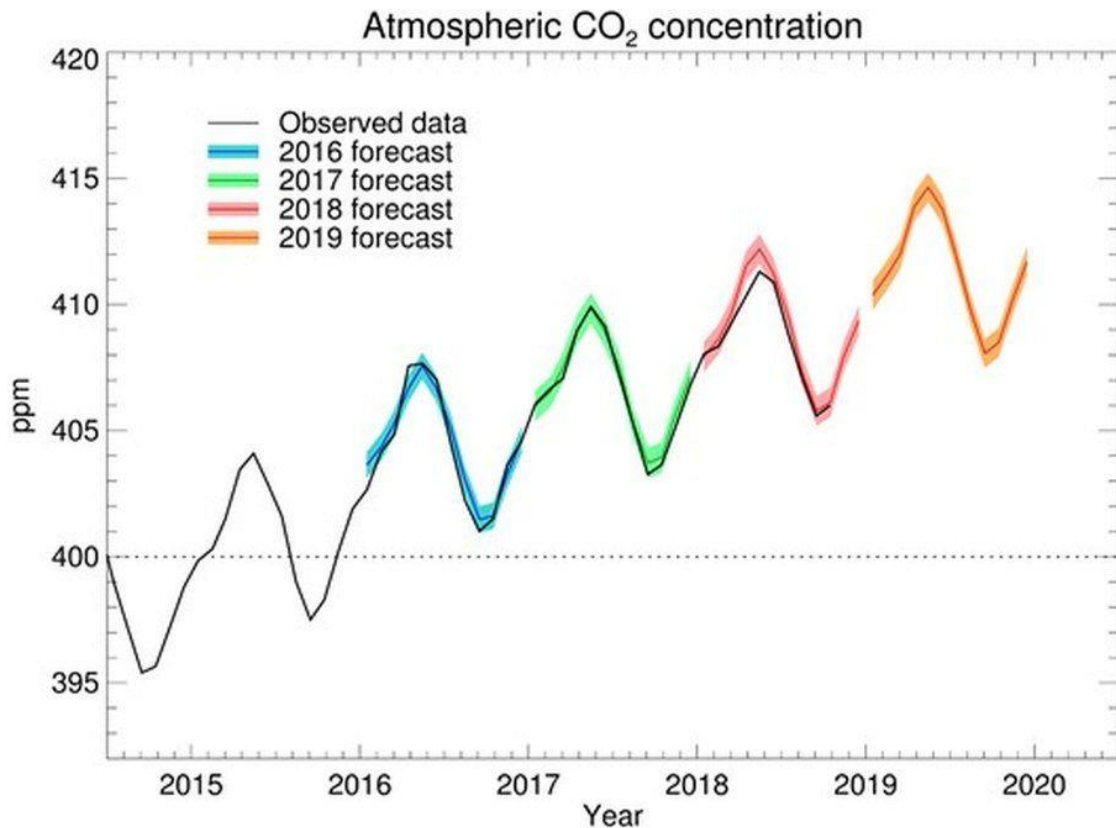
- 'Tipping point' risk for Arctic hotspot
- The battle on the frontline of climate change
- Will insect-eating dogs help climate change?

Since 1958, the research observatory at Mauna Loa in Hawaii, has been continuously monitoring and collecting data on the chemical composition of the atmosphere.

In the years since they first started recording, the observatory has seen a 30% increase in the concentration of CO2 in the atmosphere caused by emissions of fossil fuels and deforestation.

Scientists argue that the increase would have been even larger without the ability of the forests, land and seas to soak up around half of the gas emitted by human activities.

This ability however, varies with the seasons.



In the summer, CO<sub>2</sub> levels in the atmosphere fall as the trees and plants soak up more of the carbon as they grow. In the winter, when they drop their leaves, they soak up less and atmospheric levels rise.

But when temperatures are warmer and drier than normal, trees and plants grow less and absorb less. This natural variation is compounded in years when there's an El Niño event, which sees an upwelling of heat from the Pacific into the atmosphere.

"The warm sea surface conditions now will continue over the next few months and that will lead into the vegetation response," said Dr Chris Jones from the Met Office.

"Around the world this heat has different impacts. In some places, it's hotter and drier and you get more forest fires. In a tropical rainforest, for instance, you reduce the natural growth of the vegetation."

According to the Met Office, these limits on the ability to absorb CO<sub>2</sub> will see a rise in concentrations this year of 2.75 parts per million, which is higher than the 2018 level.

They are forecasting that average CO<sub>2</sub> concentrations in 2019 will be 411ppm. Carbon dioxide concentration exceeded 400ppm for the first time in 2013.

This year's predicted rise won't be as big as in the El Niño years of 2015-16 and 1997-98. However, there have only been increases similar to this year about half a dozen times since records began.

• **Climate change: China coal surge threatens Paris targets**



While the rest of the world has cut coal-based electricity over the past 18 months, China has added enough to power 31 million homes.

That's according to a study that says China is now in the process of building or reviving coal equivalent to the EU's entire generating capacity.

China is also financing around a quarter of all proposed coal plants outside its borders.

Researchers say the surge is a major threat to the Paris climate targets.

- Musicians 'have to be proactive' on climate change
- Climate signal links global floods and fires
- Warming makes bigger hurricanes more damaging
- Is China behind global coal power surge?

China's reliance on coal as a key step in developing the economy led to the fabled "one coal plant a week" building programme between 2006 and 2015.

But the push had many negative consequences, choking the air with pollution in many Chinese cities and leading to huge overcapacity. Many of these plants were only able to run 50% of the time.

In 2015, in an attempt to curb the growth, the national government tried to clamp down on new-build coal. However, it continued to allow provincial governments the freedom to issue permits for new coal plants. That move misfired badly.

Local authorities subsequently permitted up to five times more plants than in any comparable period.

According to Ted Nace, from coal researchers Global Energy Monitor, it was like a "snake swallowing a goat".

"This goat that the snake swallowed is still moving through the snake, and it's coming out in the form of another 20% in the Chinese coal fleet on top of a fleet that was already over-built," Mr Nace added.

The researchers say that through 2018 and up to June 2019, countries outside of China cut their coal power capacity by 8.1 gigawatts (GW). In the same period, China added 43GW, enough to power around 31 million homes.

The authors say that right now the amount of coal power under construction or under suspension and likely to be revived is about 147.7GW, an amount that is almost the same as the entire coal generating capacity of the European Union (150GW).

Compared to the rest of the world, China is building about 50% more coal plants than are under construction in all other countries combined.



The country is on track to top 1,100GW of coal by 2020.

The Chinese government has signalled that it wants to rely less on coal for the country's energy production and is making some headway cutting coal's share of total energy from 68% in 2012 to 59% in 2018.

However, despite the share going down, absolute coal consumption has gone up in line with overall energy demand.

What concerns the researchers is that within China, coal and electricity industry groups are pushing for an even bigger increase in the country's overall coal power capacity.

"The thing we are super worried about is that industry has actually organised to keep the whole thing going," said Ted Nace.

"There are three different powerful trade groups, proposing to increase the coal fleet by 40%. This is sheer madness at this point."



China is also busy financing coal development outside the country, funding over a quarter of all the coal plants outside its borders in countries like South Africa, Pakistan and Bangladesh.

Observers outside of China say they are concerned that by building or permitting these plants, the authorities are locking in a form of power generation that just doesn't make sense economically.

"The economics will not be borne out," said Mark Lewis, head of climate change investment research at BNP Paribas Asset Management.

"I would argue that almost all this new capacity that's being added will never make the economic return on which they have been premised. Those assets that are coming online now will have to be written down; they will be stranded assets essentially."

The bigger question is how this new coal will affect the ability of the world to meet the targets set out in the Paris climate agreement.

The researchers say that by 2030, China needs to reduce its coal power capacity by over 40% from current levels in order to meet the reductions required to hold global warming well below 2C.

"China's proposed coal expansion is so far out of alignment with the Paris Agreement that it would put the necessary reductions in coal power out of reach, even if every other country were to completely eliminate its coal fleet," said co-author Christine Shearer of Global Energy Monitor.

"Instead of expanding further, China needs to make significant reductions to its coal fleet over the coming decade."

Global Energy Monitor was originally known as Coal Swarm and has received funding from environmental groups, including the ClimateWorks Foundation, the Rockefeller Family fund, the US National Resources Defence Council, the European Climate Foundation, among others.

- **Climate change: 12 years to save the planet? Make that 18 months**

Do you remember the good old days when we had "12 years to save the planet"? Now it seems, there's a growing consensus that the next 18 months will be critical in dealing with the global heating crisis, among other environmental challenges. Last year, the Intergovernmental Panel on Climate Change (IPCC) reported that to keep the rise in global temperatures below 1.5C this century, emissions of carbon dioxide would have to be cut by 45% by 2030.



But today, observers recognise that the decisive, political steps to enable the cuts in carbon to take place will have to happen before the end of next year.

The idea that 2020 is a firm deadline was eloquently addressed by one of the world's top climate scientists, speaking back in 2017.

"The climate math is brutally clear: While the world can't be healed within the next few years, it may be fatally wounded by negligence until 2020," said Hans Joachim Schellnhuber, founder and now director emeritus of the Potsdam Climate Institute.

The sense that the end of next year is the last chance saloon for climate change is becoming clearer all the time.

"I am firmly of the view that the next 18 months will decide our ability to keep climate change to survivable levels and to restore nature to the equilibrium we need for our survival," said Prince Charles, speaking at a reception for Commonwealth foreign ministers recently.

- UK heatwave 'set to break records'
- Records tumble as Europe swelters in heatwave
- 'No brainer' fuel change to cut transport CO2
- Used cooking oil imports may boost deforestation
- Government 'like Dad's Army' on climate change

- **Climate change: Heatwave made 'at least' five times more likely by warming**



Last week's record breaking heatwave across much of Europe was made "at least five times" more likely to happen by climate change, say scientists.

Their rapid attribution study says that rising temperatures "super-charged" the event, making it more likely to happen than through natural variability alone.

Heatwaves in June are now about 4C hotter than they used to be, the researchers said.

Globally, the average temperature for June was the highest on record.

- Why Europe's heatwave is so unusual
- In pictures: Europe seeks relief from the heat
- Extreme heat triggers huge Spain wildfire

Heatwaves naturally occur in summertime but last week's event in many European countries was unprecedented because it happened so early, and the recorded temperatures were so high.

Records were broken at locations in France, Switzerland, Austria, Germany and Spain.

The new French record, established at Gallargues-le-Montueux last Friday, was more than 1.5C above the previous high mark.

Much of the concern about the heat focused on France, with red alerts in several areas, many schools were closed, exams were postponed and health minister Agnès Buzyn warned that "everyone is at risk".

The immediate cause of the heatwave was the weather, with hot air drawn in from northern Africa, caused by high pressure over central Europe and a storm stalling over the Atlantic.

By lucky coincidence, the authors of this new study happened to be in Toulouse, France, at a conference on climate change and extreme events.

The researchers, members of the World Weather Attribution Group decided to use the opportunity to analyse the link between human-induced climate change and the heatwave.

They defined the heatwave as the highest three-day averaged daily mean temperature in June, arguing that this is a better indicator of health impacts than maximums or minimums.

The researchers compared the observations of temperatures recorded during the month of June with climate models that can show how the world would be without the human influence on the climate.

They found that, over France, the probability of having a heatwave had increased by at least a factor of five. However, the researchers say that this influence could be much higher still, by a factor of 100 or more.

"We are very confident that this lower boundary of factor five is valid - but we are not confident we can say much more than that," said Dr Geert Jan van Oldenborgh, senior researcher at the Royal Netherlands Meteorological Institute.

"The reason we are fairly careful is because we found fairly large discrepancies between the modelled properties of heatwaves and the observed properties of heatwaves. They all show stronger heatwaves but the trend in the observations is much larger than in the trends in the model."



PREPARED BY:

1. PATIL ARUN
2. SANAP JYOTI
3. TAYDE KAJAL



*Adarsh Shikshan Mandal's*

**KONARK IDEAL COLLEGE OF SCIENCE & COMMERCE**

(Affiliated to University of Mumbai) (Hindi Linguistic Minority College)

CAMPUS : Adarsh Vidya Nagari, At.Wasar (Bhal), Post-Dwarli, Via Kalyan Railway Station,  
Haji Malang Road, Dist.Thane(MS) 421306. PH. : (0251) 3204294 / 3204394

E-mail : [konarkideal@idealcollege.in](mailto:konarkideal@idealcollege.in)

Web-[www.idealcollege.in](http://www.idealcollege.in)

# **Ideal Nature Club** **Presents**

## **“AANGAN BOOKLET”**

### **YEAR 2019-2020**

### **VOL 3**

**INDEX**

<b>Sr No.</b>	<b>Title</b>	<b>Page No.</b>
1	Climate change: COP25 island nation in 'fight to death'	3
2	Climate change: Oceans running out of oxygen as temperatures rise	4
3	Climate change: Met Office says warming trend will continue in 2020	6
4	Climate change: Where we are in seven charts and what you can do to help	8

• **Climate change: COP25 island nation in 'fight to death'**



The president of an island nation on the frontline of climate change says it is in a "fight to the death" after freak waves inundated the capital.

Powerful swells averaging 5m (16ft) washed across the capital of the Marshall Islands, Majuro, last week.

But President Hilda Heine said the Pacific nation had been fighting rising tides even before last week's disaster.

Political leaders and climate diplomats are meeting in Madrid for two weeks of talks amid a growing sense of crisis.

This conference of the parties, or COP25, was due to be held in Chile but was cancelled by the government due to weeks of civil disturbances.

Spain then stepped in to host the event, which will see 29,000 attendees over the two weeks of talks.

- Greenhouse gas concentrations break records
- Massive Attack help create carbon-zero tours
- Critical year for climate change
- What is climate change?
- Climate change: Where we are in seven charts
- The world's average surface temperature is rising rapidly because human activities release greenhouse gases such as carbon dioxide (CO<sub>2</sub>). These gases trap heat in the atmosphere, a bit like the glass roof of a greenhouse.
- At the meeting, Ms Heine commented: "Water covers much of our land at one or other point of the year as we fight rising tides. As we speak hundreds of people have evacuated their homes after large waves caused the ocean to inundate parts of our capital in Majuro last week."



- She added: "It's a fight to the death for anyone not prepared to flee. As a nation we refuse to flee. But we also refuse to die."
- Ms Heine is not alone in the view that small nations like the Marshall Islands face an imminent existential threat. At the Madrid summit, ambassador Lois Young, from the Alliance of Small Island States (AOSIS), which represents low-lying coastal countries and small island nations, launched a rebuke to the world's big polluters.
- "We are disappointed by inadequate action by developed countries and outraged by the dithering and retreat of one of the most culpable polluters from the Paris Agreement," she said.
- "In the midst of a climate emergency, retreat and inaction are tantamount to sanctioning ecocide. They reflect profound failure to honour collective global commitment to protect the most vulnerable.

- **Climate change: Oceans running out of oxygen as temperatures rise**



Climate change and nutrient pollution are driving the oxygen from our oceans, and threatening many species of fish.

That's the conclusion of the biggest study of its kind, undertaken by conservation group IUCN.

While nutrient run-off has been known for decades, researchers say that climate change is making the lack of oxygen worse.

Around 700 ocean sites are now suffering from low oxygen, compared with 45 in the 1960s.

Researchers say the depletion is threatening species including tuna, marlin and sharks.

- Concerns over ocean heating report
- Last decade 'on course' to be warmest
- Birds 'shrinking' as the climate warms

The threat to oceans from nutrient run-off of chemicals such as nitrogen and phosphorus from farms and industry has long been known to impact the levels of oxygen in the sea waters and still remains the primary factor, especially closer to coasts.

However, in recent years the threat from climate change has increased.

As more carbon dioxide is released enhancing the greenhouse effect, much of the heat is absorbed by the oceans. In turn, this warmer water can hold less oxygen. The scientists estimate that between 1960 and 2010, the amount of the gas dissolved in the oceans declined by 2%.

That may not seem like much as it is a global average, but in some tropical locations the loss can range up to 40%.

Even small changes can impact marine life in a significant way. So waters with less oxygen favour species such as jellyfish, but not so good for bigger, fast-swimming species like tuna.



"We have known about de-oxygenation but we haven't known the linkages to climate change and this is really worrying," said Minna Epps from IUCN.

"Not only has the decline of oxygen quadrupled in the past 50 years but even in the best case emissions scenario, oxygen is still going to decline in the oceans."

For species like tuna, marlin and some sharks that are particularly sensitive to lack of oxygen - this is bad news.

Bigger fish like these have greater energy needs. According to the authors, these animals are starting to move to the shallow surface layers of the seas where there is more of the gas dissolved. However, this makes the species much more vulnerable to over-fishing.

If countries continue with a business-as-usual approach to emissions, the world's oceans are expected to lose 3-4% of their oxygen by the year 2100.

This is likely to be worse in the tropical regions of the world. Much of the loss is expected in the top 1,000m of the water column, which is richest in biodiversity.

- **Climate change: Met Office says warming trend will continue in 2020**



Next year will continue the global warming trend with temperatures again likely to rise more than one degree above pre-industrial levels.

According to the Met Office, 2020 will likely be 1.11C warmer than the average between 1850-1900,

The year ahead is set to extend the series of the warmest years on record to six in a row.

Scientists say the strongest factor causing the rise is greenhouse gas emissions.

- Five things we've learned from Madrid climate talks
- Last decade 'on course' to be warmest
- El Nino's long reach to Antarctic ice

The world first broke through one degree above pre-industrial temperatures back in 2015.

Each year since then has seen temperatures close to or above this mark.

The warmest year on record is 2016 when a strong El Niño made a significant difference.



This weather phenomenon sees sea surface temperatures increase in the central and eastern Pacific and it's associated with a range of impacts around the world, including the overall global level of warming.

According to the Met Office, the chances of a strong El Niño in 2020 are low. They forecast that the global average temperature next year will be in the range of 0.99C to 1.23C with a central estimate of 1.11C. The researchers say that the key factor will be emissions of CO<sub>2</sub> and other warming gases.

"Natural events - such as El Niño-induced warming in the Pacific - influence the climate system, but in the absence of El Niño, this forecast gives a clear picture of the strongest factor causing temperatures to rise - greenhouse gas emissions," said Professor Adam Scaife, the Met Office head of long-range prediction.

On the rise

According to researchers, carbon dioxide emissions this year have risen slightly, despite a drop in the use of coal.

The Global Carbon Project's annual analysis of emission trends suggests that CO<sub>2</sub> will go up by 0.6% in 2019.

The rise is due to continuing strong growth in the utilisation of oil and gas.

The scale of emissions has a direct bearing on temperatures, scientists say.

Provisional figures released earlier this month by the World Meteorological Organization (WMO) suggest 2019 is on course to be the second or third warmest year ever.

If those numbers hold, 2015-2019 would end up being the warmest five-year period on record.

The Met Office say they have confidence in their prediction for 2020 based on what's happened in previous years.

This time last year they estimated that 2019 would be 1.10C above the 1850-1900 mark. The actual temperature recorded this year from January to October shows a global mean 1.11C.

- **Climate change: Where we are in seven charts and what you can do to help**



Climate change is set to cause major changes across the world: sea levels will rise, food production could fall and species may be driven to extinction.

The UN has warned that the world needs to limit climate change to below 1.5C above pre-industrial levels. But scientists say that keeping to the 1.5C target will require "rapid, far-reaching and unprecedented changes" in all aspects of society. Over the past few years, climate scientists have shifted the definition of what they believe is the "safe" limit of climate change.

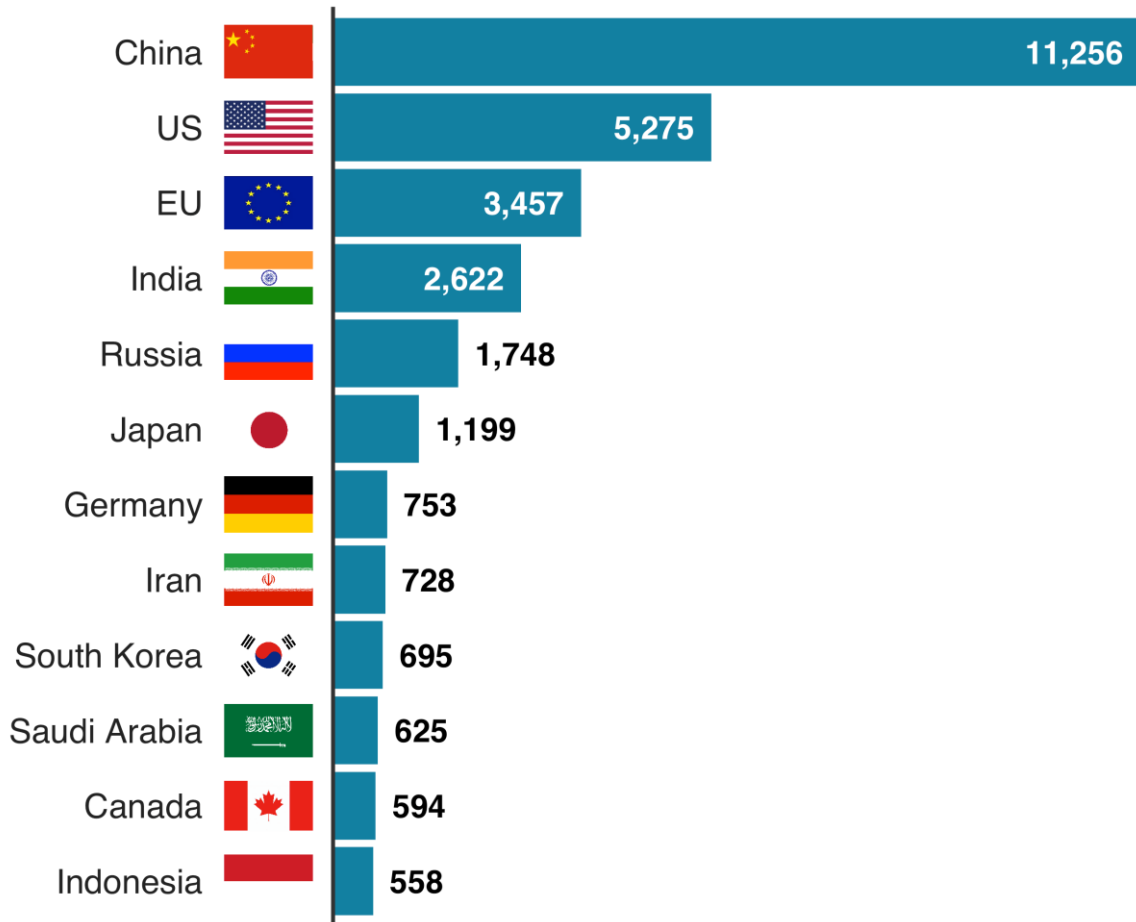
For decades, researchers argued the global temperature rise must be kept below 2C by the end of this century to avoid the worst impacts.

Countries signing up to the Paris agreement pledged to keep temperatures "well below 2C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5C".

But scientists now agree that we actually need to keep temperature rises to below 1.5C.

# The world's top emitters of carbon dioxide

Megatonnes of CO2 per year



Note: One megatonne = 1,000,000 tonnes

Source: EC, Emissions Database for Global Atmospheric Research, 2018 data **BBC**

# Arctic sea ice minimum extent 1980

7.7 million square km



Source: National Snow and Ice Data Center



PREPARED BY:

1. MISHRA RITIKA
2. DALVI GANESH
3. ANGRE TANMAY



*Adarsh Shikshan Mandal's*

**KONARK IDEAL COLLEGE OF SCIENCE & COMMERCE**

(Affiliated to University of Mumbai) (Hindi Linguistic Minority College)

CAMPUS : Adarsh Vidya Nagari, At.Wasar (Bhal), Post-Dwarli, Via Kalyan Railway Station,  
Haji Malang Road, Dist.Thane(MS) 421306. PH. : (0251) 3204294 / 3204394

E-mail : [konarkideal@idealcollege.in](mailto:konarkideal@idealcollege.in)

Web-[www.idealcollege.in](http://www.idealcollege.in)

# **Ideal Nature Club** **Presents**

## **“AANGAN BOOKLET”**

### **YEAR 2019-2020**

### **VOL 4**



**INDEX**

<b>Sr No.</b>	<b>Title</b>	<b>Page No.</b>
1	Coronavirus recovery plan 'must tackle climate change'	3
2	Climate change: World mustn't forget 'deeper emergency'	5
3	Climate change: Blue skies pushed Greenland 'into the red'	7

• **Coronavirus recovery plan 'must tackle climate change'**



Tackling climate change must be woven into the solution to the Covid-19 economic crisis, the UK will tell governments next week.

Environment ministers from 30 countries are meeting in a two-day online conference in a bid to make progress on cutting greenhouse gas emissions.

The gathering is called the "Petersberg Climate Dialogue".

It will focus on how to organise a "green" economic recovery after the acute phase of the pandemic is over.

The other aim is to forge international agreement on ambitious carbon cuts despite the postponement of the key conference COP26 - previously scheduled for Glasgow in November (now without a date).

Alok Sharma, the UK Climate Secretary and president of COP26, said: "I am committed to increasing global climate ambition so that we deliver on the Paris Agreement (to stabilise temperature rise well below 2C).

"The world must work together, as it has to deal with the coronavirus pandemic, to support a green and resilient recovery, which leaves no one behind.

"At the Petersberg Climate Dialogue, we will come together to discuss how we can turn ambition into real action."

- 'Gob-smacking' vision for future UK transport
- Don't bail out airlines, say climate campaigners
- Virus will transform UK work and travel, says AA

The informal conference is co-hosted by the UK and Germany.

Developed and developing countries will attend, along with the UN Secretary General, Antonio Guterres, and members of civil society and business. Last week, Mr Guterres warned that climate change was a deeper problem than the virus.

Campaign groups will be sceptical about the meeting. Since the Paris deal to cut emissions, CO2 has actually been rising - although there's currently a blip in the trend thanks to the Covid recession.

The development charity CARE says it's alarmed that public finance provided from rich countries to developing countries to adapt to inevitable climate change actually decreased in 2018.

Sven Harmeling from CARE said: "If governments fail to make their economic stimulus sustainable and equitable, they will drive our planet much deeper into the existential economic, social and ecological turmoil caused by the climate crisis."

The EU is already set on delivering a green stimulus. The Commission's Green Deal chief, Frans Timmermans, said every euro spent on economic recovery measures after the COVID-19 crisis would be linked to the green and digital transitions.

"The European Green Deal is a growth strategy and a winning strategy," he tweeted.

"It's not a luxury we drop when we hit another crisis. It is essential for Europe's future.

Meanwhile, China appears set on its current carbon-intensive development path, and President Trump says the US will rescue struggling fossil fuel firms.

Even in Europe there's a degree of push-back against the idea of a green stimulus

Markus Pieper, an MEP from the centre-right German CDU party, told the magazine FOCUS that the EU's sweeping plan for investment in clean technologies would no longer be possible.

He said: "The Green Deal was a gigantic challenge for an economy in top shape. After the corona bloodletting, it is simply not financially viable."

But the UK climate economist Lord Stern told BBC News: "The immediate priority is the current Covid crisis – but then we have to build for the future.

"Timmermans is right and Trump is wrong. We should only be bailing out firms that are going to contribute to tackling climate change.

"They don't have to be ostensibly clean tech firms at the moment – but they do have to be committed to cutting their emissions in line with international targets."

• **Climate change: World mustn't forget 'deeper emergency'**



Despite the impacts of the coronavirus pandemic, the world mustn't forget the "deeper environmental emergency" facing the planet.

That's the view of the UN Secretary General Antonio Guterres, in remarks released to celebrate Earth Day.

The toll taken by the virus is both "immediate and dreadful", Mr Guterres says.

But the crisis is also a wake-up call, "to do things right for the future," said the Secretary General.

- Coronavirus outbreak 'greatest test since WW2'
- Blue skies pushed Greenland 'into the red'
- Trump's WHO de-funding 'as dangerous as it sounds'

Mr Guterres re-iterated his view that the coronavirus is the biggest challenge the world has faced since the Second World War.

But as the world commemorates the 50th anniversary of Earth Day, the planet's "unfolding environmental crisis" is an "even deeper emergency", he says.

"Biodiversity is in steep decline," Mr Guterres stated.

"Climate disruption is approaching a point of no return.

"We must act decisively to protect our planet from both the coronavirus and the existential threat of climate disruption."

A long-term advocate of strong action to tackle global heating, Mr Guterres is now proposing six climate-related actions that should shape the recovery after the virus.

The world has to deliver new jobs and businesses through a "clean, green transition".

Taxpayers' money, when it is used, "needs to be tied to achieving green jobs and sustainable growth".

Money must be used to make people and societies more resilient to climate change, he says.

"Public funds should be used to invest in the future not the past."

Fossil fuel subsidies from governments is a theme that Mr Guterres has highlighted many times. These must end he says, and polluters must pay for their pollution.

The world will need to work together, says the Secretary General, and climate risks will need to be factored into the financial system and be at the heart of all public policy.



The links between climate change and the coronavirus have also been highlighted by many observers and experts in the field.

"While the pandemic will lead to a temporary dip in global greenhouse gas emissions, this must not distract from the urgent need for rapid fundamental changes in infrastructure, energy, land use and industrial systems to set us on a path to net zero emissions globally by 2050 at the latest," said Andrew Norton, director of the International Institute for Environment and Development (IIED).

"Land use change and deforestation are primary global drivers of biodiversity destruction. They heighten the risk of further pandemics by bringing humans into contact with new threats such as the coronavirus. Every species lost is an irreversible event that decreases the resilience of natural and human systems on a permanent basis."



On the 50th anniversary of Earth Day, which was first established on April 22 1970, many researchers are keen to highlight how the threats to the planet have grown over time.

"The Covid-19 pandemic is a reminder that our existence on Earth is fragile," said Dr Karen O'Neill, from Rutgers University in the US.

"Environmentalism since that first Earth Day has expanded to recognise links between human health and ecosystems."

"Degraded environments and pollution make us more likely to encounter novel viruses and to be more vulnerable to those viruses when they start to circulate."

- **Climate change: Blue skies pushed Greenland 'into the red'**

While high temperatures were critical to the melting seen in Greenland last year, scientists say that clear blue skies also played a key role.

In a study, they found that a record number of cloud free days saw more sunlight hit the surface while snowfall was also reduced.

These conditions were due to wobbles in the fast moving jet stream air current that also trapped heat over Europe.

As a result, Greenland's ice sheet lost an estimated 600 billion tonnes.

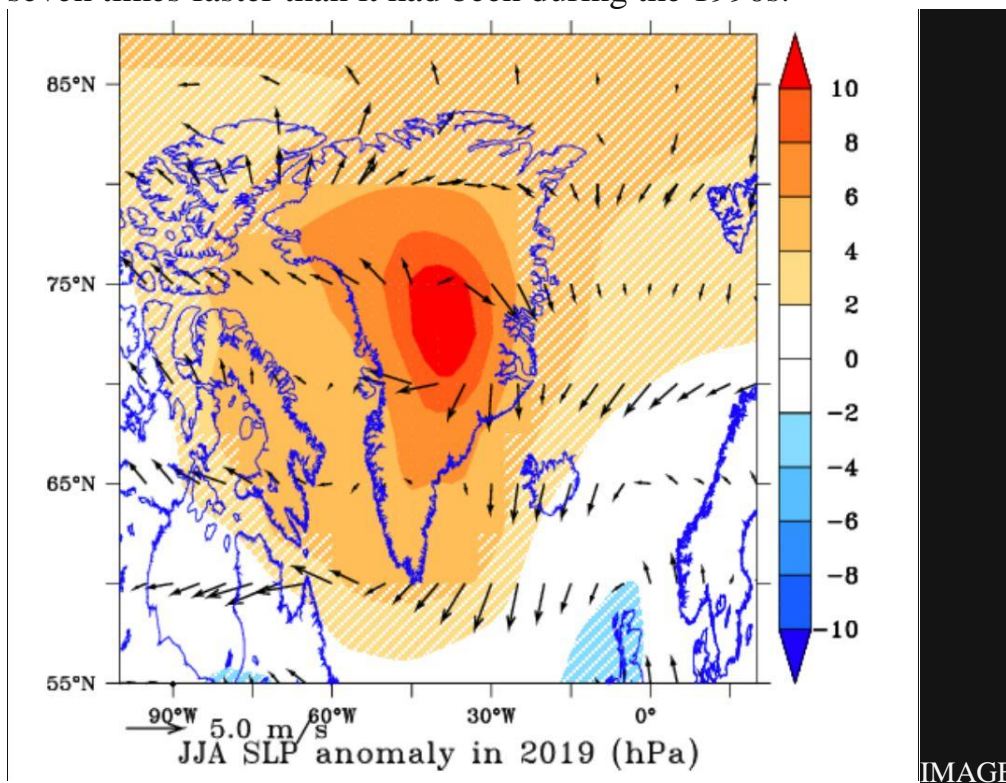
Current climate models don't include the impact of the wandering jet stream say the authors, and may be underestimating the impact of warming.

- Greenland's ice faces melting 'death sentence'
- Greenland and Antarctica ice loss accelerating
- Greenland ice melt 'is accelerating'



Greenland's ice sheet is seven times the area of the UK and up to 2-3km thick in places. It stores so much frozen water that if the whole thing melted, it would raise sea levels worldwide by up to 7m.

Last December, researchers reported that the Greenland ice sheet was melting seven times faster than it had been during the 1990s.



Average pressure over Greenland in summer 2019, with arrows showing wind direction

In recent weeks, an analysis of last year's melting said the 600 billion tonnes of ice added 2.2mm to global sea levels in just two months.

This new study says that while rising global temperatures played a role in the events last year, changes in atmospheric circulation patterns were also to blame. Researchers found that high pressure weather conditions prevailed over Greenland for record amounts of time.

They believe this is connected to what's termed the "waviness" in the jet stream, the giant current of air that mostly flows from west to east around the globe.

As the current becomes more wobbly, it bends north, and high pressure systems that would normally move through in a few days become "blocked" over Greenland.

These systems had different impacts depending on the part of Greenland you were in.

In the southern part of the island, the authors say, it caused clearer skies with more sunlight hitting the surface.

The cloud-free days brought less snow, which meant that 50 billion fewer tonnes were added to the ice sheet.

The absence of snow also exposed bare, dark ice in some places which absorbed more heat - contributing to the melt.



In other parts of Greenland, the changing atmospheric patterns had different but equally damaging impacts.

In northern and western region, the swirling but stuck high pressure systems pulled in warm air from southern latitudes.

"You can imagine that a sort of vacuum cleaner that is spinning clockwise and sucking all the warm and moist air from New York City for example," said lead author Dr Marco Tedesco from Columbia University in New York, US.

"And because of the rotation, it deposits this warm, moist air high in the northern part. It forms clouds, and they behave like a greenhouse, trapping the heat that would normally radiate off the ice."

Dr Tedesco explained that Greenland in 2019 experienced the largest drop in surface mass balance since records began in 1948.



The term surface mass balance describes the overall state of the ice sheet after accounting for gains from snowfall and losses from surface melt-water run-off.

The authors believe their study explains why, despite the fact that 2019 was not as warm as 2012, last year produced a record drop in surface mass balance.

"This is really pushing Greenland into the red," said Dr Tedesco.

Other researchers working in this field agreed that the new paper is a good explanation of what happened last year in Greenland.

"The main message of the paper is that the very high melt was mostly driven by clear skies and direct melting rather than necessarily being attributable to unusually high temperatures over the ice sheet - a radiatively-driven, rather than thermally-driven, melt season as they put it," said Dr Ruth Mottram, a climate scientist at the Danish Meteorological Institute in Copenhagen.

"In some ways, the weather pattern is rather similar to the great blocking high that lodged over Scandinavia for weeks in 2018, giving us the most extreme drought on record in much of northern Europe."

The exact mechanism by which climate change affects the jet stream isn't understood. But the view is that as the Arctic warms, the temperature differences between the region and the mid-latitudes that drive the air current are reduced. This slows down the stream, making it wander further.

"The more CO<sub>2</sub> we pump out, the more divergence starts to emerge between the behaviour of the Arctic and the mid-latitudes and this behaviour is accelerating and enhancing some of the differences. It is a crucial part of what is creating this waviness and the consequences," said Dr Tedesco.

The authors also argue that climate models in general need to take account of this impact of the wavy jet stream. Others in the field say this issue needs addressing.

"These results imply that the climate models we use for future projections of sea level rise from Greenland are underestimating the extreme years at present and therefore likely also the rate at which the ice sheet melts and the oceans will rise in the future," said Dr Mottram.

"The only ray of light is that as processor power increases and we can do higher resolution simulations with climate models, the representation of these processes does seem to improve and not just in Greenland but in other areas of the world where persistent blocking patterns can have an important influence on the season."

**PREPARED BY:**

1. BHOSALE TEJASWINI
2. WAYLE MANAV
3. RAUT DEEPIKA