Enviro Monitor

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Climate change

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Ocean surface climates may disappear by 2100: study. Up to 95 per cent of Earth's ocean surface will have changed by the end of the century unless humanity reins in its carbon emissions, according to study published in the journal Scientific Reports. Ocean surface climates, defined by surface water temperature, acidity and the concentration of the mineral aragonite -- which many marine animals use to form bones and shell -- support the vast majority of sea life. The world's seas have absorbed around a third of all carbon pollution produced since the Industrial Revolution. But with atmospheric CO_2 levels increasing at a rate unprecedented in at least three million years, there are fears that ocean surface climates may become less hospitable to the species it hosts. Researcher modelled global ocean climates across three time periods: the early 19th century (1795-1834); the late 20th century (1965-2004); and the late 21st century (2065-2014). They then ran the models through two emissions scenarios.The first -- known as RCP4.5 -- envisions a peak in greenhouse gas emissions by 2050 followed by a slow decrease across the rest of the century. The second scenario -- RCP8.5 -- is a "business as usual" approach, where emissions continue to rise throughout the next 80 years. The team also found that while ocean surface climates showed little sign of change during the 20th century, by 2100, up to 82 percent of ocean surface may experience climates not seen in recent history. These include seas that are hotter, more acidic and that contain fewer minerals vital for sea life to grow.

The researchers found that under the RCP4.5 scenario, 36 per cent of the ocean surface conditions present throughout the 20th century are likely to disappear by 2100.

Extreme heat growing health issue; killed 356,000 people in 2019: Study. More than 356,000 people died in 2019 as a result of extreme heat and that number is likely to grow, according to a study published in *The Lancet* . The Global Burden of Disease review, funded by the Bill & Melinda Gates Foundation, found while cold temperatures still cause a greater number of deaths, mortality rates attributable to heat are growing faster, particularly in hotter regions of the world. The findings echo another report, a two-part series called Heat and Health that was also published in *The Lancet* recently. It calls for global warming to be limited to 2.7 ^{o}F, in line with the Paris Climate Accord, to reduce heat-related mortality in the future. Otherwise, deaths will increase further and extreme heat will also lessen worker productivity and exacerbate other environmental challenges, such as wildfires, researchers said. In addition to causing heat stroke, high temperatures have been linked to increased hospitalizations and mental health issues. Older people and other vulnerable groups, such as those with low mobility, are likely to be more at risk. High temperatures can also reduce productivity.

Mumbai, Chennai & 10 other cities to see sea levels rise in 30 years. According to NASA, Indian coastal areas will face a sea level rise of 0.1 metre to 0.3 metre in the next two to three decades due to global warming, with Bhavnagar in Gujarat facing a rise of 0.22 met a rise of 0.22 metres that may submerge vast low-lying areas , a projection by NASA has said. The sea-level rise and its impact will be experienced in varying degrees in other coastal cities and ports such as Kochi, Mormugao, Mumbai, Mangaluru, Chennai, Vizag and Paradip during the period, shows an online visualisation tool of the US space agency using projections from the latest report of the UN's Intergovernmental Panel on Climate Change. The tool shows a decline (0.05m) in sea level at Kidderpore (near Kolkata) by 2040 and this minor fall can be

attributed to a shift in ocean water circulation and other climatological factors due to warming. The rise is higher in the long-term (by 2100) but it can be balanced if the world takes deep emission cuts beyond mid-century. Information through NASA's online tool that assessed location-based projections can be used by policymakers in taking critical decisions about economic and public policy to protect local communities from the potentially devastating effects of sea-level rise in coastal areas.

The projection features 12 Indian cities, with Bhavnagar hit by 2040 followed by Kochi (0.15 m), Mormugao, Kandla and Okha (0.13m at each location) and Mumbai (0.12m) among coastal cities and towns in the present global GHG emissions cut scenario from the current (1995-2014 baseline) level.

UN's 'code red' warning on climate change: Key takeaways for India. The UN's Inter-governmental Panel on Climate Change (IPCC) projected global temperature to reach or exceed 1.5°C of warming over the next 20 years under all scenarios. Calling the Working Group I contribution to the Sixth Assessment Report, Climate Change 2021: The Physical Science Basis, a "code red for humanity", the UN said the world would have to drastically cut greenhouse gas emissions in the next two decades if it wants to spare humanity from climate change's disastrous consequences, leading to destruction of natural habitats.

Some important projections about India include:

- Warming over India is projected to be in sync with the global average
- India is expected to see an increase in frequency and severity of hot extremes
- Forest fire incidents may rise due to increased heat wave conditions
- Increase in annual mean precipitation is projected
- Increase in rainfall would be more severe over southern parts of India
- Rainfall could increase by around 20% on the southwest coast compared to 1850-1900 level
- Monsoon precipitation is projected to increase in the mid to long-term over South Asia
- Rising temperature and precipitation can increase the occurrence of glacial lake outburst floods and landslides over moraine-dammed lakes
- Regional mean sea level will continue to rise

EU unveils climate masterplan to 'give humanity a fighting chance'. The European Union has unveiled sweeping new legislation to help meet its pledge to cut emissions of the gases that cause global warming by 55 percent over this decade, including a controversial plan to tax foreign companies for the pollution they cause.The proposals by the EU's executive branch, the European Commission, range from the de-facto phasing out of gasoline and diesel cars by 2035 to new national limits on gases from heating buildings.

Key Proposals

- World's first carbon border tax, on imports of carbon-intensive steel, aluminium, cement, fertilisers and electricity
- Effective ban on the sale of new petrol and diesel cars from 2035
- Increase renewable share in energy mix to 40% by 2030
- Quotas for states to boost natural carbon sinks
- Airlines to lose tax exemption for aviation fuel
- Shipping to be included in block's emissions trading system and costs for polluters to rise

Deccan Herald, August 26, 2021 | Business Standard, August 26, 2021| The Times of India, August 18, 2021|The Economic Times, August 10, 2021 | Business Standard, July 15, 2021

Air pollution impacting monsoon, India at a risk of losing 10-15% of mean rainfall in coming years: Experts. While air pollution's health and economic impacts are well established, experts say it is also impacting the Southwest Monsoon and the country is at a risk of losing 10%-15% of mean rains in coming years. Places with highest levels of air pollution will see maximum impact with some seeing a reduction in rains by almost half of their average rainfall. Besides a decline in precipitation due to anthropogenic (human-led) emitting sources in the atmosphere, the country might also see a surge in extreme weather events such as torrential rains, severe hailstorms or increasing number of dry days on account of rising air pollution. Air pollution is the result of suspended particles or aerosols in the atmosphere from anthropogenic sources along with natural dust. Monsoon, meanwhile, is a seasonal oceanic phenomenon governed by the change in the wind pattern due to differential heating of the tropics, driven by the temperature difference between land and ocean. While increase in the concentration leads to warming of the atmosphere it also simultaneously cools land surface and according to meteorologists, any kind of change in differential heating of land and ocean will impact the wind pattern.

Scientists from IITM Pune develop new model to tackle air pollution menace in Delhi-NCR. Scientists have come up with a Decision Support System that will not just help zero in on the exact sources contributing to Delhi's pollution, but also predict practical scenarios in winters. The practical scenario prediction will include the level of pollution if a certain sector is shut down or sources from a certain area/district are controlled and this will help the government decide which sector to shut down or where to reduce activity in view of the prevailing air quality in Delhi. Apart from Delhi, there are 19 districts around the national capital, sources from which affect pollution levels in Delhi. This latest model can help avoid trial and error and blind decisions. The model, developed by scientists from the Indian Institute of Tropical Meteorology (IITM) in Pune, will be operationalised by October

The Tribune, August 23, 2021 | The Weather Channel, July 21, 2021

New advanced oxidation technology can enhance waste water reuse at lower cost. A new UV-photo catalysis technology can treat municipal sewage and highly polluting industrial wastewater streams, and increase its reuse, said the Department of Science and Technology (DST). The current treatment practices are inefficient because of high dependence on biological treatment systems, which are unable to bear shock loads. This is followed by tertiary treatment systems involving reverse osmosis and Multi Effect Evaporators (MEE), the DST said in a statement. These systems have large carbon footprint and maintenance costs making wastewater treatment highly unsustainable and unaffordable. Due to this, researchers felt that there is a need to integrate novel approaches and advanced technologies in current systems. TERI has developed a technology called the Advanced Oxidation Technology or TADOX which can reduce less dependence and load on biological and tertiary treatment systems and help achieve zero liquid discharge (ZLD). It can bring down capital expenditure on ZLD by 25-30 per cent and operating expense by 30-40 per cent for industrial wastewater treatment. TADOX developed by TERI, New Delhi, for wastewater treatment is an effort in this direction. The technology involves UV-Photo

catalysis as an Advanced Oxidation Process at the secondary treatment stage leading to oxidative degradation and mineralisation of targeted pollutants.

Explained: What a new study says about microplastic pollution in river Ganga. NGO Toxics Link has released a study titled, Quantitative analysis of microplastics along River Ganga, which has found that the river – which flows through five states covering about 2,500 km before flowing into the Bay of Bengal – is heavily polluted with micro plastics. For the study, samples of Ganga's water were collected from Haridwar, Kanpur and Varanasi and microplastics were found in all of them. Apart from micro plastics, there were other kinds of plastics as well such as single-use plastic and secondary plastic products. Of the samples, those taken at Varanasi had the highest concentration of plastic pollution. This study exhibits the spatial distribution of microplastics in the Ganga along densely populated areas. Its emphasis is on the emerging pollutant in the inland river system, underlining its role as a transporter of plastic fragments finally into the ocean.

The Hindu, August 26, 2021| The Indian Express, July 26, 2021