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Short note on kerala flood 2018

View this area in EO Explorer Swollen rivers have altered the landscape in India's state of Kerala. Image of the Day for August 25, 2018 Instruments: Landsat 8 — OLI Sentinel-2 Image of the Day Land Water Floods Human Presence View more Images of the Day: In August 2018, heavy monsoon rains drenched southeast Asia. The flood that devastated Kerala in August 2018, following unprecedented heavy monsoon rain, was among the five major extreme flooding events in the world between 2015 and 2019, the hottest five-year period on record, according to the World Meteorological Organisation (WMO).The heat wave in many parts of India in May-June 2015, the floods in the North-eastern States in August 2017, and the devastating dust storm in Uttar Pradesh and Rajasthan in May 2018 are also listed from India among 35 extreme events caused by climate change during that period in a report released by the WMO on September 23.The report, titled "The Global Climate in 2015-2019" and released on the eve of the United Nations Climate Action Summit in New York, provides an assessment of the state of the earth under the increasing influence of climate change and its impact.It says that the global average temperature has increased by 1.1°C since the pre-industrial period, and by 0.2°C compared to 2011-2015. Although data from the last six months of 2019 were not included, the report said that this year, too, would most likely join the preceding four years to be "the warmest of any equivalent period on record globally".Fifth biggest floodThe flood in Kerala in August 2018 was the fifth biggest in the world during the five years from 2015, after similar events in China (June-July 2016), North-eastern India (August 2017), Sierra Leone (August 2017) and Japan (June-July 2018).Rainfall in August 2018 in Kerala was 96 per cent above the long-term average in the State. There were 433 deaths owing to the Kerala floods and the total economic losses were estimated at Rs.31,000 crore.The heat wave that hit many parts of India in 2015 resulted in more than 2,500 deaths. The worst affected were Andhra Pradesh and Telangana, where daytime surface air temperature reportedly rose to between 40°C and 45°C. Odisha, Gujarat and West Bengal, too, were affected. Many victims died as a result of dehydration, heatstroke or heat exhaustion.Floods in Assam, Arunachal Pradesh and Manipur (and many regions in Bangladesh and Nepal) in August 2017 resulted in as many as 1,200 deaths, according to the report.The major dust storm that hit Uttar Pradesh, Rajasthan and Delhi in May 2018 claimed at least 112 lives as high winds dispersed tonnes of dust and left a trail of destruction in its wake.There is increasing evidence that human-induced climate change is responsible for the rise in extreme weather events all over the world. The report estimates that over 20,000 people died in extreme weather events during 2015-2019 and in all, such events resulted in \$572 billion in economic losses worldwide.Heatwaves were the deadliest meteorological hazard in the 2015-2019 period, affecting all continents and setting new temperature records in many countries. More than 8,900 deaths have been attributed to heat waves worldwide in the 2015-2019 period. Such heatwaves have been accompanied by wildfires in many regions, including in Europe and North America. The 2019 northern summer saw record-breaking wildfires that extended to the Arctic region, setting new records, and widespread fires in the Amazon region.Among the regions that experienced a large increase in frequency of drought conditions in 2015-2019 compared to the 14-year average, was Tamil Nadu in India, along with large areas in Africa, parts of central America, Brazil, the Caribbean, Australia and West Asia.Around 30 per cent of the world's population now live in climatic conditions that deliver potentially deadly temperatures at least 20 days a year.Among all weather-related hazards, tropical cyclones were associated with the largest economic losses, with floods, landslides and associated loss and damage. The hazard with the maximum economic loss was Hurricane Harvey in 2017, which led to an estimated economic loss of more than \$125 billion.Ice melt and global warmingThe report also discusses the issue of ice melt as an indicator of global warming, and the continuing decrease in the extent of summer and winter sea ice in the Arctic and the Antarctic regions, the significant changes in the Greenland and Antarctic ice sheets in recent decades, the record ice mass loss that glaciers are experiencing, and the clear downward trend in spring snow cover in the Northern hemisphere.For all years from 2015 to 2018, the Arctic's average September minimum (summer) sea ice extent (the area covered by sea ice that contains an ice concentration of 15 per cent or more) was well below the 1981-2010 average. Indeed, Arctic sea ice is melting faster than previously estimated by satellite data. The Arctic sea-ice extent for July 2019 set a record low and the period from 2015 to 2018 was marked by a considerable retreat of the Arctic sea-ice beyond the central Arctic. From 1979 to 2018, the summer sea-ice extent in the Arctic has declined at a rate of 12 per cent per decade. The winter sea-ice extent decline occurred at a rate of about 2.7 per cent per decade, during the same period.A similar phenomenon is visible in the Antarctic, too, which experienced an abrupt decrease in sea ice during 2015-2019, in sharp contrast to increasing trends in summer and winter seasons during 2011-2015, as well as the longer-term 1979-2018 period. Antarctica experienced its lowest and second lowest sea-ice extent in 2017 and 2018, respectively. Moreover, the report says, the amount of ice lost from the Antarctic ice sheet increased at least six-fold between 1979 and 2017. In Greenland, an accelerated loss of ice has been observed since the year 2000. The contribution to sea-level rise from Antarctica, for instance, averaged 0.36 ± 0.05 mm per year with a cumulative 14.0 ± 2.0 mm since 1979. Most of the ice loss takes place by melting of the ice shelves from below, owing to incursions of relatively warm ocean water, the report said.Rise in carbon dioxide levels The period from 2015 to 2019 also saw a continued rise in carbon dioxide levels and other greenhouse gases in the atmosphere which set new records. Carbon dioxide growth rates were nearly 20 per cent higher than the previous five years.Carbon dioxide stays in the atmosphere and the oceans for centuries, and will continue to cause a rise in temperature, in turn leading to the melting of ice, the retreat of glaciers, rise in sea level, ocean temperatures and extreme weather events. Rising carbon dioxide concentrations have also led to an increase in ocean acidification.At the same time, the level of oxygen has been on the decline in the open and coastal oceans, including estuaries and semi-enclosed seas, the report points out. Global warming is expected to contribute to this decrease directly because the solubility of oxygen decreases in warmer waters, and indirectly through changes in ocean dynamics that reduce ocean ventilation, which is the introduction of oxygen to the ocean interior.The report also warns of continuing sea-level rise at an accelerated rate. The total elevation of the global mean sea level since 1993 has reached 90 mm. Over the five-year period 2014-2019, the rate of global mean sea-level rise was 5 mm per year, "corresponding to a volume of water discharged by the Amazon river in about three months", the report said.This is substantially faster than the average rate since 1993 of 3.2 mm per year. The melting of land ice from the glaciers and ice sheets has also increased over time and is a major factor that contributes to sea-level rise.The capacity of the oceans to absorb heat is a critical part of the climate system, and the report indicates that ocean heat content has reached record levels since 2015. The year 2018 had registered the largest ocean heat content values on record, with 2017 ranking second and 2015 third.The current increase in the rate of the world's ocean heat content in the 0-2000-metre layer is about 20 times as much as the world's annual primary energy consumption, which in 2017 was 13.51 million tonnes of oil equivalent.The ocean which absorbs around 30 per cent of the annual emissions of anthropogenic carbon dioxide to the atmosphere and helps alleviate the collective impact of climate change on the planet however also becomes more acidic as a result of absorbed carbon dioxide reacting with seawater.The last 20 to 30 years have shown a clear trend of decreasing average pH because of increasing concentration of carbon dioxide in seawater: Overall, there has been an increase of 26 per cent in ocean acidity since the beginning of the industrial era, the report said.All this is causing dramatic changes in the physical, chemical and biological state of the marine environment, with significant impact on food chains and marine ecosystems, and on fisheries.The WMO report says the likelihood of many of such extreme weather events has been significantly increased by anthropogenic climate change, and evidence is mounting that it is the medium and low-income countries and the poor of the world who are more exposed and vulnerable to such climate variability and extremes. 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