

Limited resources and unlimited usage.
How can we save it?

Newsletter



**Conserve the energy,
Save our climate!**

September - 2019

Ozone special

Issue : 34

Nanotechnology

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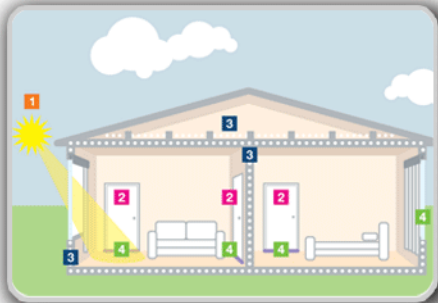
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Why ???

We the people on the earth are gifted with wonderful energy sources by the nature, which has made our routine much more smother & easier... However, this gift of the nature is ' limited '. What we have done is, with the growth of science & technology, we have started using it extremely, because of which the energy resources are going to finish in near future. Hence, let us take the pledge to conserve the energy - save the energy!!!


Tip of the Month



Sealing cracks, gaps, leaks, and adding insulation can save up to 10% on home heating and cooling costs.

**ConserveTM
The Energy**

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Article - 1 : Indoor exposure to air pollution studied

In an Indoor Air study conducted in a suburb of the city of Kuopio, Finland, relatively short-lasting wood and candle burning of a few hours increased residents' daily exposure to potentially hazardous particulate air pollution. Associations between indoor air pollutants and building ventilation or cooking were also observed. The study found that the local outdoor levels of certain pollutants and ozone were the most important determinants of indoor levels of the same air pollutants.

Ample burning of wood in small-scale room heaters and sauna stoves is likely to increase chronic personal exposures in the neighborhood to particulate matter that contains substantial amounts of soot and hazardous organic compounds like polycyclic organic hydrocarbons. This exposure does not take place only while staying outdoors but also indoors at home due to effective passage of the small particles through the building shield," the authors wrote. "Part of the emissions adding this type of hazardous exposure among residents, also including susceptible population groups, originates directly from the

personal use of a wood-fired room heater or sauna stove. Insufficient natural ventilation in older houses further elevates the indoor levels of the hazardous particles.

**Source: <https://www.sciencedaily.com/releases/2019/02/190221110438.htm>*



**Image Source: <https://www.financialexpress.com/india-news/read-how-indian-women-are-revolutionizing-clean-cooking-as-entrepreneurs/929373/>*

Article - 2 : China's war on particulate air pollution is causing more severe ozone pollution

In early 2013, the Chinese government declared a war on air pollution and began instituting stringent policies to regulate the emissions of fine particulate matter, a pollutant known as PM 2.5. Cities restricted the number of cars on the road; coal-fired power plants reduced emissions or were shuttered and replaced with natural gas. Over the course of five years, PM 2.5 concentrations in eastern China have fallen nearly 40 percent. The number of air quality monitoring stations across the country has grown to over 1,000, collecting unprecedented amounts of environmental data. Sifting through that data, researchers from the John A. Paulson School of Engineering and Applied Sciences (SEAS) and the Nanjing University of Information Science & Technology (NUIST), found something surprising: While PM 2.5 pollution is falling, harmful ground-level ozone pollution is on the rise, especially in large cities. As it turns out, when it comes to the war on air pollution, chemistry is a formidable foe. Ozone is the main ingredient in smog and has been studied since it began choking cities in the U.S. in the early 1950s.

"Ozone is formed through a series of chemical reactions, starting with the oxidation of volatile organic compounds (VOCs). This reaction forms chemical radicals, which drives reactions among oxides of nitrogen (NOx) and VOCs to produce ozone in the presence of sunlight. Both NOx and VOCs are emitted from fossil fuel combustion,

and VOCs can also be emitted from industrial sources. The researchers from SEAS and NUIST found that particulate matter acts like a sponge for the radicals needed to generate ozone pollution, sucking them up and preventing them from producing ozone. The rapid reduction of PM 2.5 dramatically altered the chemistry of the atmosphere, leaving more radicals available to produce ozone. "We haven't observed this happening anywhere else because no other country has moved this quickly to reduce particulate matter emissions," said Jacob.

**Source: <https://www.sciencedaily.com/releases/2019/01/190102140749.htm>*



** I m a g e*

S o u r c e :

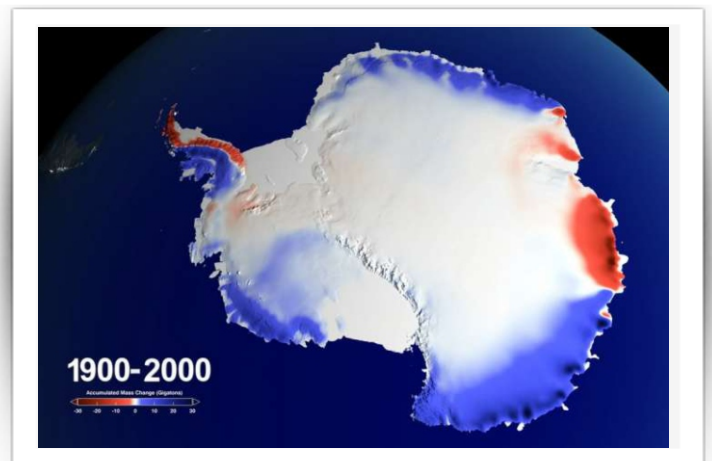
<https://www.sciencedaily.com/releases/2018/10/181018124948.htm>

Ozone layer depletion has increased snowfall over Antarctica in recent decades, partially mitigating the ongoing loss of the continent's ice sheet mass, new University of Colorado Boulder research finds. The findings, published today in the journal *Geophysical Research Letters*, show a distinct signal linking stratospheric ozone loss above Antarctica with increased precipitation, even as those gains have been outpaced by an even greater ice loss rate due to warming oceans, contributing to sea level rise. The Antarctic Ice Sheet is the world's largest ice sheet and freshwater reservoir, containing the potential for hundreds of feet of sea level rise if all ice were to melt. An ozone "hole," or a seasonal thinning of the ozone layer, forms above Antarctica in the austral summer, influencing atmospheric circulation and creating stronger circumpolar westerly winds.

The results complement a separate NASA-led study, which was led by Medley and published today in the journal *Nature Climate Change*, which uses observations from ice cores to show that Antarctic snowfall has increased in the last 200 years and especially so in the past 30 years, suggesting that precipitation changes can be linked to human-made causes such as greenhouse gas emissions as well as the ozone hole. In order to pinpoint the effect of ozone loss on Antarctic snowfall, Lenaerts and his colleagues compared two sets of eight climate modeling simulations, one set with observed ozone levels and one set with ozone values kept constant at levels before the

ozone hole started, allowing the researchers to isolate the signal relative to natural climate variability. The comprehensive analysis, which encompassed the years 1955-2005, revealed increased Antarctic precipitation during the austral summer that can be attributed to lower levels of stratospheric ozone, and which has in part buffered ice sheet mass loss. Paradoxically, while the results suggest that ozone depletion helps to partially mitigate sea level rise by increasing Antarctic precipitation, those mass gains have been more than offset by increasing iceberg calving and melting.

* S o u r c e :
<https://www.sciencedaily.com/releases/2018/12/181210101923.htm>



*Image Source: <https://phys.org/news/2018-12-snowfall-antarctica-buffers-sea-level.html>

Article - 4 : Alpine ice shows three-fold increase in atmospheric iodine

Analysis of iodine trapped in Alpine ice has shown that levels of atmospheric iodine have tripled over the past century, which partially offsets human-driven increases in the air pollutant, ozone. The study showed, however that, although iodine can destroy 'bad' ozone, there isn't enough to counter all of the production. Researchers say it is now important to include iodine data in climate models that predict future global environmental outcomes.

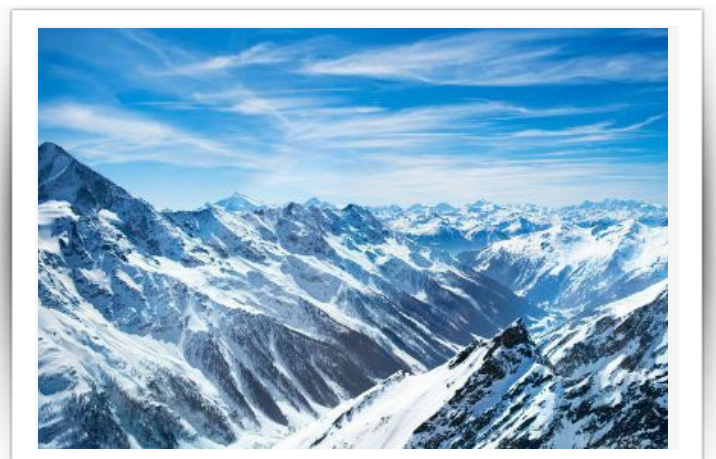
Analysis of the Alpine ice, by scientists at the University of York, University Grenoble Alpes, and Desert Research Institute, shows that iodine concentration began to increase after the Second World War following the growth in motor vehicles and electricity generation. Nitrogen oxide emissions from vehicles and power plants since the 1950s increases surface ozone, and this reacts with chemicals in seawater to release more iodine into the atmosphere, which partially, but not completely, destroys some of these harmful gases. Professor Lucy Carpenter, from the University of York's Department of Chemistry, said: "Iodine's role in human health has been recognized for some time - it is an essential part of our diets.

"Its role in climate change and air pollution, however, has only been recently recognized, and up until now, there have been no historical records of iodine in populated regions such as Europe. The study in the European Alps has now provided new long-term insight into the delicate balance of ozone in the atmosphere. Ozone in the lower atmosphere acts as an air pollutant and greenhouse gas, but ozone is also the main driver of iodine emissions from the ocean.

Once released into the atmosphere iodine acts to destroy this 'bad' ozone.

The more ozone humans produce, the more iodine is released from the ocean which can then help destroy the ozone produced by humans. This means that iodine levels in the ocean can, at least partially, act to keep ozone gases in the lower atmosphere in check, but there isn't enough to counter all of the production. However as more cars appeared on the roads in the post-war period, we get more emissions of nitrogen oxides causing more ozone in the atmosphere and therefore more iodine. Surface ozone concentrations have stabilized over much of Europe and the Atlantic Ocean, although are still growing over other regions.

*Source: <https://www.sciencedaily.com/releases/2018/11/181112191810.htm>



*Image Source: <https://www.scienceandtechnologyresearchnews.com/alpine-ice-shows-three-fold-increase-in-atmospheric-iodine/>

Conserve the Energy,
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It's
Tomorrow™


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