

EXTRACTIONS



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WORLD WATER SUPPLY THREATENED

A new study based on results obtained during the international Indian Ocean Experiment (INDOEX) indicates that airborne particles of human-produced pollution may play a significant role in weakening Earth's water cycle.

The project was designed by researchers at Scripps Institution of Oceanography at the University of California, San Diego, to assess the nature and magnitude of the chemical pollution over the tropical Indian Ocean and to assess the significance of the region's aerosols. Early in the project, INDOEX researchers documented a brownish-gray haze layer of about 10 million square kilometres formed by fossil fuel combustion and rural biomass burning. The particles within the haze were causing a three-fold decrease in solar radiation reaching the earth's surface as compared with the top of the atmosphere. As sunlight heats the ocean, water escapes into the atmosphere and falls out as rain. So as aerosols cut down sunlight by large amounts, they may be reducing the hydrological cycle of the planet.

"One of the key revelations from INDOEX is that air pollution is not only an industrial phenomenon," said Scripps Professor Paul Crutzen, a 1995 Nobel Laureate. "The part of the atmosphere that you would expect to be the cleanest — the areas without a lot of industrialization — in fact can be very highly polluted, especially during the dry season."

[From: http://scrippsnews.ucsd.edu/releases2001/indoex_water.html]

LEAP YEAR WARNING

Factor the extra day of a leap year into your calculations, Stanford researcher Raphael Sagarin warns scientists studying global warming. In one study of the timing of the ice break-up on the Tanana River in Alaska, using the calendar year to plot the data showed that spring arrived 6.2 days earlier in 2001 than in 1917. Using the tropical year (the average time between successive vernal equinoxes) gave the more accurate result of 5.5 days earlier.

[From: <http://www.stanford.edu/dept/news/pr/01/leapyear1212.html>]

NEW TCE CLEANUP PROCESS

A new bioremediation process called Bioavailability Enhancement Technology™ (B.E.T.) has been developed at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory.

Chlorinated solvents such as trichloroethylene (TCE) are common in contaminated groundwater and are difficult to remove due to the chemicals' high density and low solubility.

The bioremediation process takes advantage of natural biological processes: when bacteria already present at the site are given an appropriate food source, they break down TCE. The B.E.T. process also helps dissolve the TCE, which accelerates its degradation. The process is much cheaper than conventional methods and, because the remediation is done underground, there is no secondary waste stream. The land site essentially remains undisturbed.

A large-scale test of the B.E.T. process on a TCE-contaminated site has far exceeded expectations. TCE concentrations in the source area dropped below detection limits and the rate of breakdown of TCE was also increased. The process is estimated to save US \$23 million at this site alone.

[From: <http://www.sciencedaily.com/releases/2002/02/020206075654.htm>]

ENGINEERED GENES IN NATIVE CORN

Researchers from the University of California, Berkeley, were both surprised and concerned to discover that some of Mexico's native varieties of corn grown in remote regions have been contaminated with DNA from genetically engineered corn imported from the US.

Native corn samples were taken from four fields in the remote, mountainous region of Sierra Norte de Oaxaca. Four out of six samples tested showed weak but clear evidence of DNA from the cauliflower mosaic virus, which is widely used to insert foreign genes in crops for such things as insect protection. Mexico's Ministry of the Environment and Natural Resources found transgenic DNA in three to 10

percent of the Sierra Norte de Oaxaca corn, supporting the results of the UC Berkeley researchers.

Control samples that had not been genetically modified came from blue corn grown in the Cuzco Valley in Peru and from a collection of seeds from the Sierra Norte de Oaxaca region taken in 1971, before the creation of transgenic crops. There were no signs of transgenic DNA in the Peruvian and 1971 seed collections.

Agricultural experts and proponents of biotech crops maintain that corn pollen is characteristically heavy, so it isn't blown far from corn fields by the wind. Ignacio Chapela, assistant professor of microbial ecology in the Department of Environmental Science, Policy & Management at UC Berkeley's College of Natural Resources, said this assumption may need to be re-evaluated considering the recent findings in Mexico.

Why the surprise? It shouldn't have happened. Mexico imposed a moratorium in 1998 on new plantings of transgenic corn, and the closest region where such corn was ever known to have been planted is 60 miles away from the Sierra Norte de Oaxaca fields. Simple cross-pollination cannot wholly explain the fragmentary, diverse nature of the genetic contamination, which is a sign that other processes may be at work.

Why the concern? Unlike much of the pollution we deal with, genetic contamination can't be 'cleaned up' once it has happened. The world is at risk of losing the genetic diversity of an important food crop.

[From: http://www.berkeley.edu/news/media/releases/2001/11/29_corn.html]

YOUNG ATHLETES AND ASTHMA

Children who live in California communities with high average ozone levels and who compete in three or more team sports have a three-to-four-times higher risk of developing asthma than non-athletic kids. Researchers from the Keck School of Medicine of the University of Southern California also reported that the more sports children participate in, the greater the effect.

Of the of 3,500 children in the five-year study, 265 developed new cases of asthma. Overall, children playing team sports were more likely to develop asthma. In communities with high levels of ozone, researchers saw a trend of increasing asthma with the number of team sports children played. However, in low-ozone communities, they found no increased risk of asthma in children who played team sports.

Because athletes must breathe rapidly and deeply, they get higher doses of pollutants in their lungs. In addition, most

sports are played outside, where ozone concentrations are higher than indoors.

Conventional wisdom says air pollution can worsen existing asthma, but not cause it. However, this study suggests that ozone is indeed one factor causing asthma. Other pollutants such as particulate matter and nitrogen dioxide might also play a role in causing asthma in the young athletes, and the researchers plan further studies to better understand all the risk factors.

[From: <http://www.sciencedaily.com/releases/2002/02/020201075040.htm>]

WEAKENED WEEKEND POLLUTION

The climate-monitoring station on Mauna Loa volcano on Hawaii, 3,400 metres above sea level, could hardly be farther away from it all. Yet even here there is no escaping the weekly rhythm of modern life. Observatory records not only show an overall rise in atmospheric carbon dioxide levels over the past few decades and a seasonal cycle, but also daily variations with lower concentrations at the weekend than during the week.

Because there is no known natural cause of such a seven-day cycle, these observations likely reflect the weekday bustle and weekend lull in Hawaii's populated regions.

Could these weekly carbon dioxide cycles cause corresponding variations in climate? Some climate records already show signs of such effects with global average temperatures and regional rainfall depending to a small degree on the day of the week.

However, researchers found no such cycle in carbon dioxide records from the Amundsen-Scott South Pole Station in Antarctica, which is far from any sources of pollution. The Antarctic measurements show the same yearly trend and seasonal cycle, but there is no significant difference between average daily values. By the time carbon dioxide pollution reaches Antarctica, such short-term variations have apparently evened out.

[From: <http://www.nature.com/nsu/020211/020211-10.html>]

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