

EXTRACTIONS



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DIOXIN STUDY DELAYED AGAIN

Politics may be getting in the way of science at the US Environmental Protection Agency (EPA). At issue is a study about the effects of dioxins on human health and the environment, which has been in the works since 1991. EPA is ready to release the report, but criticism from the chemical and livestock industries will likely delay the final report further.

In the draft report, EPA describes how dioxins reach the atmosphere from combustion of household and industrial wastes and reach the water from chlorine bleaching of paper. The dioxins accumulate in the tissues of animals. EPA estimates that most of human dioxin exposure occurs through diet, with over 95% of dioxin intake for a typical person coming from eating animal fats.

EPA reports that dioxin levels in the environment have declined significantly since the 1970s — US emissions decreased 75% between 1987 and 1995, primarily from improvements in municipal and medical waste incinerators. However, there is still cause for concern as EPA says in its information sheet:

“EPA estimates that the amount of dioxin found in the tissues of the general human population (which is known as the ‘body burden’) closely approaches (within a factor of 10) the levels at which adverse effects might be expected to occur, based on studies of animals and highly exposed human populations. Despite the potential risks, currently there is no clear indication of increased disease in the general population attributable to dioxin-like compounds. This may be due to limitations of current data and scientific tools rather than indicating that dioxin exposure is not causing adverse effects. For cancer, EPA estimates that the risks for the general population ... may exceed 1 in 1,000 increased chance of experiencing cancer related to dioxin exposure. Actual risks are unlikely to exceed this value and may be substantially less. This range for cancer risk indicates an about 10-fold higher chance than estimated in EPA’s earlier (1994) draft of this reassessment.”

In Finland, Satu Alaluusua, of the University of Helsinki Institute of Dentistry, correlated the incidence of soft and

mottled teeth in young children with dioxin and furan concentrations in their mother’s breast milk. Children who had encountered the most dioxin in their mother’s milk had the highest rate of these tooth defects. The study also demonstrated how dioxin affects cellular receptors for epidermal growth factor, a hormone-like substance that contributes to the development of many tissues.

[from washingtonpost.com/wp-dyn/articles/A7743-2001April11.html, www.epa.gov/ncea/pdfs/dioxin/dioxreass.htm, and www.findarticles.com/m1200/8_155/54062579/p1/article.jhtml]

PHYTO-REMEDICATION GOES MAINSTREAM

Although there are still few full-scale phyto-remediation projects, the US Environmental Protection Agency (EPA) has been cleaning up contamination with plants since 1994 with great success and now has 200 test sites across the US.

Plants have been used to clean up solvents, metals, pesticides, explosives (such as TNT), crude oil, polyaromatic hydrocarbons, and landfill leachates. For sites that have shallow, low levels of contamination, plants are more cost-effective than the traditional approach of digging the contaminated soil and trucking it to an incinerator.

For example, at the Aberdeen Proving Ground near Baltimore, once the premier army facility for chemical testing, a fast-growing poplar stand is absorbing chlorinated solvents from the soil. Although each tree removes 30 to 50 litres of water a day, studies show very little transpiration of the solvents.

But, scientists still need to determine whether the contaminants can collect in the leaves of trees that are used for phyto-remediation and whether the contaminants are released when the leaves drop in the autumn.

[from www.pollutiononline.com/read/nl20010420/420736 and www.cluin.org/products/citguide/phyto2.htm]

ALTERNATIVE ENERGY SOURCES

Waves and food may soon become viable energy sources.

In Scotland, Wavegen launched the first commercial wave power station last November on the island of Islay off the west coast. The plant, which uses the oscillating water column system, is capable of producing 500 kilowatts for about 12 cents per kilowatt. However, this is not yet as cheap as wind power generation at about 5 cents per kilowatt, and there are concerns over where to place the offshore systems and how to mark them for navigational safety.

In California, Misha Cornes and his colleagues at the Berkeley based start-up Sea Power & Associates think they have a new way to harness the energy in waves. Their WaveRider technology uses a series of lightweight concrete floats that sit one to two miles off shore. Each float is connected to a hydraulic pump that extends nearly 60 feet down to the ocean floor. The up-and-down motion of the waves creates pressure that drives the hydraulic pump, which then drives turbines to generate electric power. To bring this technology to market, Sea Power & Associates has made a strategic alliance with HyGen Industries, developers of hydrogen energy fuel generating and fueling facilities. Says Cornes, "It's estimated two-tenths of a percent of the energy contained in the ocean could power the whole world. It's this energy source that's totally untapped."

Also in California, the Los Angeles International Airport (LAX) plans to convert its food leftovers into electricity to feed the local power grid. A joint pilot project with the City of Los Angeles Department of Public Works will determine if their discarded food can be recycled economically. The waste food will be processed to produce methane to augment the fuel supply of a nearby electrical power generating plant. Once the six-month pilot program is over, LAX hopes to divert all the nearly 8000 tons of discarded food each year from the landfill to the electrical power plant.

[from www.msnbc.com/news/587112.asp and
www.pollutiononline.com/read/nl20010508/425943]

GLOBAL WARMING ESTIMATES UP

As the earth's temperature is rising, so are the estimates of that rise. Philip B. Duffy and others at the Lawrence Livermore National Laboratory used 16 climate model simulations to determine if the increase in the number of surface thermometer sites over the years had created an artificial global warming trend, as some critics have claimed. They compared temperature trends from a globally complete model with those from one that sampled the model at only those locations where full temperature observations are available. In 10 of the 16 climate change simulations, missing data led to significant underestimates of the true global warming trend,

while the remaining 6 had no significant effect. They found that not only was the temperature increase valid, but it was larger than previously estimated, up from 0.6 degrees Celsius to 0.7 degrees.

Global warming is affecting Africa's Lake Chad. University of Wisconsin-Madison researchers, Michael T. Coe and Jonathan A Foley, who worked with NASA's Earth Observing System program, say the lake is now 1/20th of the size it was 35 years ago. They used long term climate data in a biosphere model to track the exchange of energy, water, and carbon dioxide between vegetation, soil, and the atmosphere. They passed the data from the biosphere model to a hydrological model to estimate water volume changes in the rivers, wetlands, and the lake. Satellite images from 1963 to the present tracked the size of the lake and verified the model's calculations. Coe and Foley calculate that the lake decreased in size by 30% between 1966 and 1975. During that time, irrigation accounted for only 5% of that decrease, while overall drier conditions accounted for the remaining 95%. However, irrigation demands increased four-fold between 1983 and 1994, accounting for half of the additional decrease in the size of the lake. With the drier climate and a growing population, farmers are more desperate for water for their crops and will likely continue to drain what is left of Lake Chad.

Global warming is also significantly affecting the remote Arctic, according to a major new report on the state of Arctic biodiversity. More than 150 specialists and experts throughout the Arctic contributed to the report, "Arctic Flora and Fauna: Status and Conservation," which was released in Finland by the Arctic Council's Working group for the Conservation of Arctic Flora and Fauna in June. The report notes that climate change is already having measurable effects on Arctic species, permafrost, and sea ice; alien invasive species are increasingly penetrating the region; and contaminants released thousands of kilometres away are appearing in large amounts in both human and wildlife communities.

[from www.sciencedaily.com/releases/2001/07/010704092014.htm,
www.sciencedaily.com/print/2001/02/010228080245.htm, and
www.sciencedaily.com/releases/2001/06/010612065902.htm]

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