

FINE PARTICULATE MATTER: THE GLOBAL TOLL

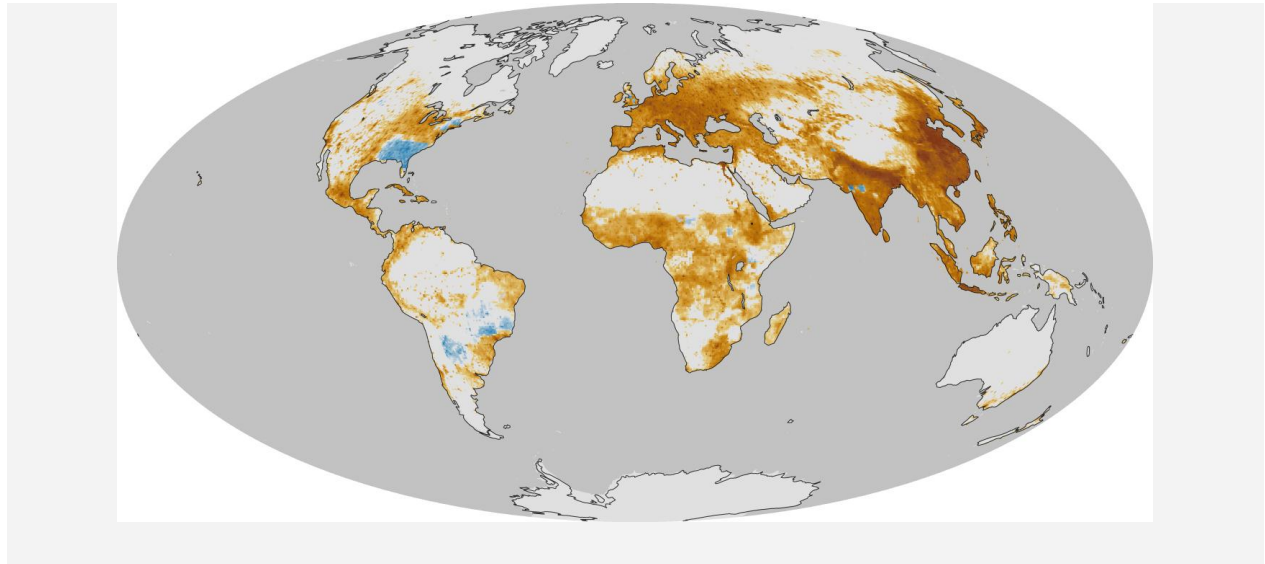
Particulate matter, also known as particle pollution or PM, is a complex mixture of very tiny solid and liquid particles made up of several components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. **Fine particles** (PM_{2.5}) are found in smoke and haze and are 2.5 micrometers in diameter and smaller. Sources of fine particles include all types of combustion — motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes.

Fine particles cause serious health problems such as heart disease, lung cancer and asthma attacks as they can get deep into the lungs — some may even get into the bloodstream.

Results from a study published in July 2013 in the journal *Environmental Research Letters* and entitled “Global premature mortality due to anthropogenic outdoor air pollution and the contribution of past climate change” indicate that **2.1 million deaths occur worldwide each year as a direct result of exposure to fine particles**. Results from the study also indicate that climate change has a minimal effect on current deaths related to air pollution.

Co-author of the study, Jason West, from the University of North Carolina, said:

“Our estimates make outdoor air pollution among the most important environmental risk factors for health. Many of these deaths are estimated to occur in East Asia and South Asia, where population is high and air pollution is severe.”



Credit: NASA Earth Observatory

The map shown here is from the NASA Earth Observatory. It is based on data provided by West and depicts the model estimate of the average number of deaths per 1,000 square kilometers (386 square miles) per year due to air pollution.

In their study, West and collaborators used estimate mortality for changes in air pollution relative to the difference in pollution levels between 1850 (modeled preindustrial conditions) and 2000 as a measure of human-caused air pollution.

Dark brown areas have more premature deaths than light brown areas.

Blue areas have experienced an improvement in air quality relative to 1850 and a decline in premature deaths.

Fine particulate matter takes an especially large toll in eastern China, northern India, and Europe — all areas where urbanization has added considerable quantities of PM_{2.5} to the atmosphere since the start of the Industrial Revolution.

A few areas — such as the southeastern United States — saw

PM_{2.5} concentrations decline relative to pre-industrial levels (shown in blue). In the southeastern United States, the decrease in PM_{2.5} is likely related to a decline in local biomass burning that has occurred over the last 160 years.

Of the estimated 2.1 million deaths occurring worldwide each year as a direct result of exposure to fine particles, 93% are caused by cardiopulmonary diseases and 7% by lung cancer.

Source: <http://theglobalfool.com/fine-particulate-matter-the-global-toll/>