



Global Dimming

Jim Haywood, Aerosol Research Manager

What is global dimming?

Global dimming is the widespread observation of a reduction of sunlight at the surface of the earth. This tends to happen in cloud free regions, so it is something that is blocking sunlight from the surface of the earth.

What is global brightening?

Global brightening occurs when pollution levels are reduced. If you reduce the pollution levels, you reduce the blanket of pollution above the surface of the earth which means that you get more sunlight at the surface of the earth – and that is global brightening.

Is the whole world getting dimmer?

The whole world is not getting dimmer. Some areas are continuing to show global dimming trends, but some areas are actually showing reversals, where you are now actually getting global brightening.

Where is getting brighter and where is getting dimmer?

Areas that are continuing to show global dimming tend to be areas where pollution is still increasing. Areas like Hong Kong, the Far East, around Asia and India, places like that are continuing to show dimming trends. Areas where there's been a reversal to global brightening tend to be areas where pollution is being cleaned up. Particularly areas over Europe are showing now a reverse trend to global brightening.

Is Hong Kong getting dimmer because China has so much pollution?

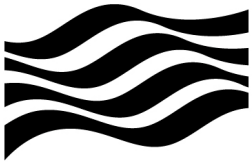
In a way, places like Hong Kong are showing continued global dimming because of the pollution that is being emitted in the environment close to china. Areas like china have not instigated a tremendous amount of clean-up technology, certainly not the levels of clean-up technology that have been going on across Europe since about the mid 1980's.

We still see smog in the UK. So where is this pollution coming from?

The highest intensity of smog events and low visibility events in the UK tend to occur when we have got an easterly wind. This is when the industrial sources in Europe – the winds bring that pollution over the UK leading to, if you like, a dimming at that time when we have the easterly winds.

How do you know this is happening?

We know that global dimming and global brightening is happening in various places because of the long records of observations that are taken in standard metrological surface based observation sites. These tend to measure the sunlight that is being received at the surface at any time of day and some of these are showing global dimming trends and some of these are showing global brightening trends.



Met Office

What is causing global dimming? Is it just pollution?

We think that the aerosol particles, which are tiny microscopic particles emitted from pollution, are the predominant cause of the global dimming and global brightening phenomena. Recently there has been some nice evidence that has shown that the global dimming and global brightening are also correlated to observations of atmospheric visibility. Reductions in visibility are caused when there is a lot of pollution in the atmosphere. So that is really starting to conclusively prove that pollution is the main cause of global dimming and global brightening.

Is pollution a good thing then? Why would we want to get rid of it?

Pollution has a lot of side effects. It is bad for human health. It also causes acid rain, which leads to the collapse of many different ecosystems. So pollution in itself should be reduced. It is the causes of the global warming that really need to be addressed as well.

Is there a link between global dimming and global warming?

Global dimming and global warming are, or appear to be linked. Global warming is caused by increases in greenhouse gas concentrations. However, if you have also got a reduction in the amount of pollution in the atmosphere, so that you are causing a global brightening, you are getting more sunlight through to the surface of the earth, which causes an additional warming.