

Changing Colors

Humans can and do, to a degree, control albedo by altering the color of the earth. For many thousands of years, human intervention through fire, farming, logging, and industry has substantially altered local, regional, and eventually planetary albedo.

The human propensity to burn things results in a substantial increase in atmospheric particulates and greenhouse gasses, which change the color of land, water, ice, and atmosphere. In general, human activity tends to alter the color of the earth, usually resulting in increased conversion of sunlight to heat. The colors of human infrastructure tend to have a lower albedo than the natural environment that they replace.

With the invention of the axe, the world's forests began to recede. With the invention of the chainsaw, the rate of deforestation accelerated manifold. In conjunction with the population explosion of the 20'th century, this has resulted in the consumption of most of the world's forests, with many consequences, such as changes in color, changes in cloud cover, increased carbon dioxide in the atmosphere, and an increased susceptibility to fire which results in lower albedo on land and an increase in carbon particulates in the atmosphere. All of these events result in substantial changes in albedo.

The massive population decline of the indigenous population in North America caused by the introduction of European diseases caused abrupt reforestation and decreased greenhouse gas emissions, changing the color of both land and atmosphere, contributing to the last little ice age.

Before we plowed the Great Plains, the prairie grass would stick up through the snow, convert sunlight to infrared, and quickly melt the snow which was absorbed into a thick sponge of sod. This resulted in a short winter and a long spring. When we plowed the Great Plains, without the grass sticking up, the snow stayed longer, but when it melted, without the sod sponge, it ran off quickly. This resulted in long winters and a short spring. Gradually, as more and more particulate smog was deposited on the snow, it melted faster until we had short winters, short springs, and a whole lot of summer. Now, due to the climate change of the fourth northern climate zone, we're beginning to see longer winters and even less spring and fall.

Throughout the evolution of the industrial revolution, the ratio of carbon to hydrogen in the fuels we burn has steadily decreased [from wood to coal to oil to gas to hydrogen], but as population increases and we find more and more ways to utilize fossil energy, the volume of carbon dioxide in the atmosphere is steadily increasing. As the efficiency of combustion steadily increases, the ratio of greenhouse gasses to particulates in the smog we produce is substantially increasing, resulting in an acceleration of both surface and atmospheric warming. The result has been what is commonly known as global warming, although the warming we're talking about only concerns about one millionth of the mass of the earth in a tiny speck of time, and we really don't know all that much about how and how much.

We have the ability to slow the onset of the extreme climate shifts coming in our immediate future if we pay attention and get to work, but it would just buy time to adapt. If we try to control weather and climate, we'd best be aware that we'll be reacting to a very sketchy view of the past in an attempt to change the future of an extremely complex system about which we know very little. Only a very few people will have sufficient understanding to maybe get it right, while a lot of people will fail to understand that they don't and could easily make a deadly mess of it. Harebrained schemes like releasing sulfur dioxide into the upper atmosphere to reverse global warming could tip us very quickly into drastic cold. We're dancing on the edge and a misstep could be deadly.