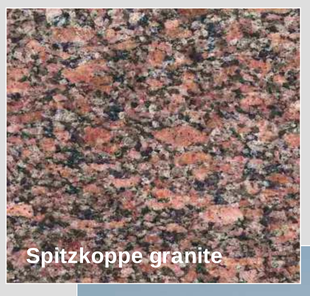
International Year of Planet Earth

Earth and health -
building a safer environment

Geology may appear remote from human health. However, rocks are the fundamental building blocks of the Earth's surface, full of important minerals and chemical elements. Most elements are taken into the human body in air, food and water. Rocks are broken down by weathering processes to form the soils on which crops and animals are raised. Drinking water travels through rocks and soils as part of the water cycle, and much of the dust and some of the gases contained in the atmosphere are of geological origin.

Earth and Health, or "Medical Geology", is concerned with the relationship between natural geological factors and human and animal health - as well as with improving our understanding of the influence of environmental factors on the geographical distribution of health problems. Medical Geology brings together Earth scientists and medical/public health researchers to address health problems caused or exacerbated by geologic materials (rocks, minerals and water) and processes - such as volcanic eruptions, earthquakes and atmospheric dust.

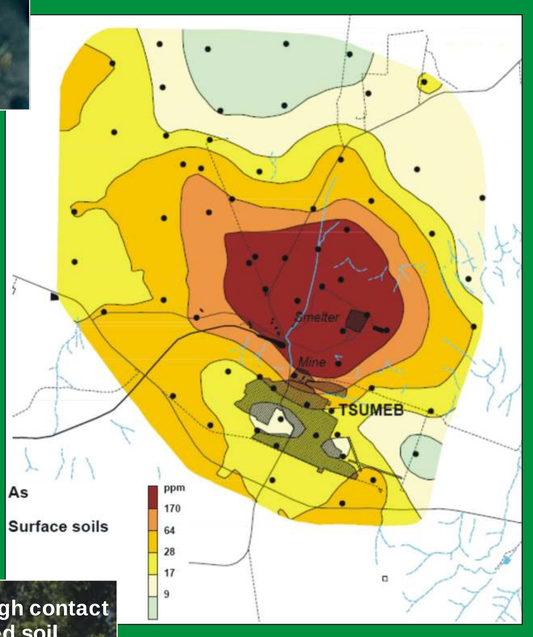


Spitzkoppe granite

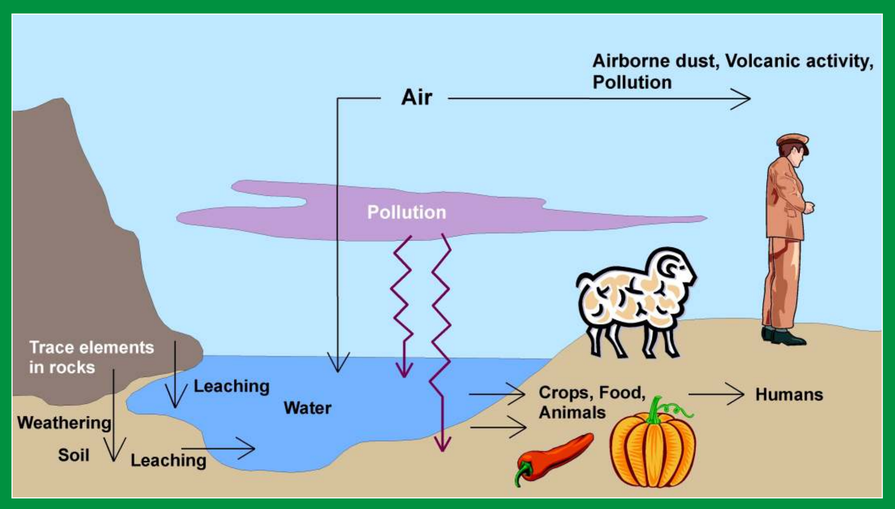
Well-known for the occurrence of beautiful gemstones, such as aquamarine and topaz, the prominent inselbergs of Gross and Klein Spitzkoppe near Karibib are also targets for uranium exploration. Their granitic rocks contain significantly elevated levels of this element in the form of various radioactive minerals

Gross Spitzkoppe

"The right dose differentiates a poison and a remedy" - Paracelsus



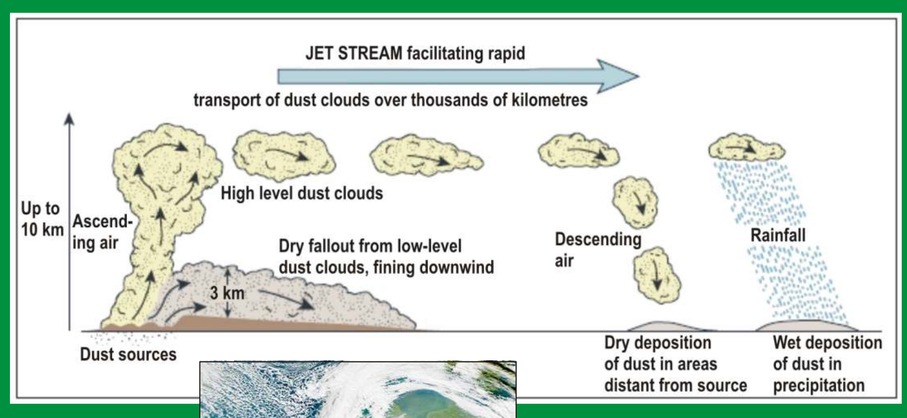
Elevated contents of heavy metals in soil in the vicinity of mining, processing and other industrial operations can put residents at a health risk, e.g. for skin disorders (above). Areas where these values exceed international health guidelines must be excluded from residential and agricultural development



Interaction between lithosphere, atmosphere and biosphere: minerals leached from rocks permeate the soil and groundwater (above), while airborne dust and human pollution can be transported over great distances before finally settling on the ground by either dry or wet deposition (below)

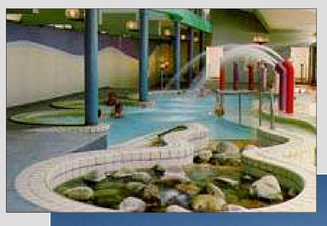
While the detrimental effects of industrial pollution on human and animal health are by now generally acknowledged, until lately little was known about the way our natural environment can influence our welfare. Although the beneficial effects, for instance, of mineral-rich hot springs were discovered relatively early, the fact that a number of more or less serious conditions and diseases are directly related to the presence or absence of certain natural substances in the soil, drinking water or in the air we breathe, has only been widely appreciated for the last couple of decades.

Even today not many people are aware that areas with a high concentration of granites, such as central Namibia, are subject to natural radiation from the decay of radioactive elements, like thorium and uranium, which are usually contained in this rock type. Similarly people living in desert environments, like the towns of Namibia´s seaboard, are prone to natural silicosis, a condition caused by very fine dust particles penetrating deeply into the lungs. Other natural substances, while being beneficial and even essential to human diet in small doses (e.g. fluorine), may cause a variety of degenerating effects when ingested excessively. For these reasons a constant and effective monitoring of our natural environment is not only desirable but necessary, especially as a growing population continues to make ever bigger demands upon it.



Sand storms and volcanic eruptions, the most common natural sources of dust, have not only local effects. The finest particles from the Indonesian volcano Krakatoa, which erupted in 1883, were spread right around the globe by high winds (the satellite image on the left shows wind systems reaching across Europe and northern Africa)

From Warmbad and Ai-Ais in the south to Sesfontein in the north, Namibia has numerous more or less famous hot springs and spas, some of which have been developed for touristic and / or therapeutic purposes



Ai-Ais Hot Spring

Sandstorm in Swakopmund

On days like the one captured in this satellite image (right), hundreds of thousands tonnes of sand are blown from the Namib Dunes into the Atlantic Ocean, blanketing the coastal areas and towns with fine mineral dust. Thick clouds of dust - apart from causing lung disease in those regularly exposed to them - block substantial amounts of incoming sunlight, which in turn can influence marine phytoplankton production and have a cooling effect on regional climates

Sandstorm on the road to Lüderitz

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